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# A Review of the Hardware, Iron and Metal Trades.

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The Hay Process Steel for Structural Purposes.

For some years the attention of engineers has been turned to the great advantages to be obtained by the use of steel for structure on purposes. Its greater strength permitted of a large reduction of section—so feating for some years at the seel made by Messrs. Hussey & Co. of Pittsburgh, by what is known as the Hay Process—so called from its inventor—seems, so far as tests have been made (some chough, it was believed, to cover the increased cost of the material. In many forms this reduction would equal in weight to per cent. It has been mainly to the steels produced by the Bessemer and openiment for process—it is low steel with a high tensile strong that these efforts have been directed, as they are more readily produced in the masses required and are cheaper than cracible steel. Two obstacles, however, has steed in the masses required and are cheaper than cracible steel. Two obstacles, however, has been made of it for use in the Glasgow fine for the courtesy of this firm we are directed, as they are more readily produced by the following process: It is now steel with a high tensile store of the courtesy of this firm we are directed, as they are more readily produced by the following process: The problem was for building purposes, the first difficulty being one of manufacture. The problem was been turned to the great advantages to be obtained by the following process: It is low steel with a high tensile store of the courtesy of this firm we are directed, as they are more readily produced by the following process: It is now steel with a high tensile strong the problem was for building purposes, the first difficulty being one of manufacture. The problem was been made to the courtesy of this firm we are should be an other steel in many form the courtesy of this firm we are should be an other steel in the masses required and are cheaper than cracible steel. Two obstacles, however, has been made to the case of the material. In many form the line of the Chicago and Alto For some years the attention of engineers has been turned to the great advantages to be obtained by the use of steel for structural purposes. Its greater strength permitted of a large reduction of section—enough, it was believed, to cover the increased cost of the material. In many forms this reduction would equal in weight 100 per cent. It has been mainly to the steels produced by the Bessemer and openhearth processes that these efforts have been directed, as they are more readily produced in the masses required and are cheaper than cracible steel. Two obstacles, however, have stood in the way of their extended use for building purposes, the first difficulty being one of manufacture. The problem was to produce uniformly a steel of high tensile strength, "low" or "mild" enough to best canswer the purposes to which it would be applied—that is, a steel was wanted with the high tensile strength of steel, the elongation and reduction of the best wrought iron and greatest uniformity.

The second obstacle to its use has been the lack of full and reliable data for the calcustion of trains. This want has compelled its of creains.

quirements were that the steel should be uniform, both as to analysis and mechanical test, tough and ductile at all temperatures from 120 to 30 degrees F., capable of sustaining without fracture, in the sizes and shapes actually required, 80,000 lbs. to the square inch of original section. The elongitude of the section being one of manufacture. The problem was to produce uniformly a steel of high tensile strength, "low" or "mild" enough to best answer the purposes to which it would be applied—that is, a steel was wanted with the high tensile strength of steel, the elongation and reduction of the best wrought iron and greatest uniformity.

The second obstacle to its use has been the lack of full and reliable data for the calculation of strains. This want has compelled engineers in using steel to make their specifications as though they were using iron—or, in other words, they have not been able to take advantage of the superior strength

still in a molten state, an addition is made of a matte or sponge, square inch of original section. The elongation was to be not less than 10 per cent. When strained to 48,000 lbs. the metal was to stand a smart blow of a black-smith's hammer without permanent set. It was also to be capable of being bent cold, in a round bear 1/2 inch in diameter, through the particles by the removal of all vestiges of cinder. Just the method of its action, as well as the estact influence of the constituents of the matte and the proportion of beer very savered.

Ultimate permanent extension, 10 per cent.

Test No. 9-Tensile Strength-Aug. 5th, 1878. Bolt I in. diameter, with thread cut each Bott in diameter, with thread cut each end—American standard—with wrought nuts 2 in. long, as per sketch (Fig. 8). Diameter at bottom of thread — 13-16 in., broke at bottom of thread. Area at bottom of thread — 0.518 sq. in. Broke with 58,000 pounds total strain—111,969 pounds per sq. in. Elongation of bolt in 12 in. — 1/4 in.

age elongation of bar - 9 9-10 per cent.; maximum do. — 12 per cent.; minimum do. — 83% per cent.

It is hardly necessary to comment on these

tests. In every case where it is possible they exceed the requirements. They show a tensile strength of 90,000 to 100,000 pounds, a tensile strength of 90,000 to 100,000 pounds, elongation something over 10 per cent. and a reduction of 34 to 44 per cent.; that is, they show that this metal possesses all the strength of steel and elongation and reduction of iron, and, if they prove anything, prove that this material is admirably adapted for structual purposes.

apted for structural purposes.

Some tests have been made with this steel in chains that show very good results. The Stirling Chain Works, of Buffalo, N. Y., made some tests of chain on their machine with the following results:

with the following results:

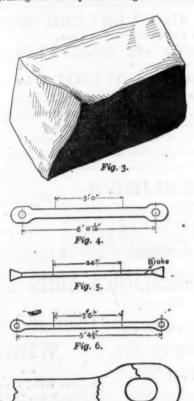
Size. Reduction. Stress. Tons.

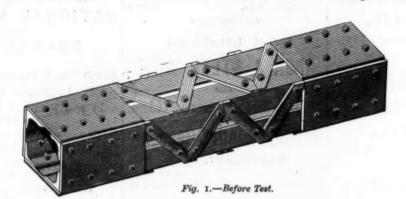
Round steel. 1-32 full 1-32 33

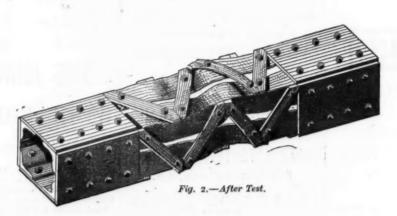
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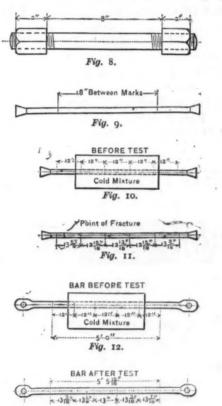
Only sand was used as a flux, and the fracture;, which were clean, crystalline and bright, showed that the welds held. At bright, showed that the welds held. At the Chicago Chain Works of S. G. Tay-lor, the Hay steel was used for a chain for a dredge, being worked the same as iron, except that the steel raquired more labor. When tested, the chain broke at 35 tons, while the best chain of this size required to stand but 24 tons, and ordinary 18 tons admiralty proof test. Before closing this article, we wish to again refer to one of the main obstacles that has always presented







TEST GIRDERS, BARS AND BOLTS OF HAY STEEL, FOR THE GLASGOW (MO.) BRIDGE.



it-has put the limit of strain at 61/2 tons per square inch only, and thus gave no encourgement for the employment of the high-class material. It seems as though a can be had, the admirable paper read by Mr. Adamson before the recent meeting of Iron and Steel Institute at Paris, is deave proof.\* This paper gives the most corough tests of mild steels ever made, and shows that even comparatively hard ceals, with one-half per cent. of carbon, .o. seeis, with one-half per cent. of carbon, or per cent. of manganese and small propor-tions of sulphur, silicon and phosphorus, re-quired 20 tons to produce a permanent set, and had a maximum strength of 53½ tons per square inch; being, therefore, twice as strong as the double best Yorkshire iron, while it elongated 14½ per cent. Instead of objections, there are many points in

Started Here &

hese points in the following manner:

"From the experiments made on the properties of iron and steel, it will be apparent that the users of metals must, as it were, make some natural selection to secure the highest and best results for any special purpose; and it will also be clear that no prought iron can resist convenient force. can resist concussive force qual to mild steel; and as a much higher This paper was published in The Iron Age, belong 17, page 3.

is taken of the superior strength of steel and much credit is due to Gen. Wm. Sooy Smith, the engineer, for his courage in adopting steel as the material for its construction. Not one pound of iron has been allowed in it; the fish bars, lock nuts, track atterial that has a tensile strength of 45 to allowed in it; the fish bars, lock nuts, track to the other track stringers, and the same and the same

Hay steel. We have said that this is the first bridge We have said that this is the mass orage in the world, made entirely of steel, in which advantage is taken of the superior strength of steel. There are in Europe at least two steel bridges—one in Sweden and one over the Douro, in Portugal—but they are built as though the material were iron.

are built as though the material were iron. This country possesses three bridges the larger part of which is steel. One in California, a small iron suspension bridge of some 200 feet span, and the St. Louis and East River bridges. The former, the St. Louis Bridge, is generally supposed to be a steel bridge, but the facts are that not half the metal is steel. There were used in its construction at 10 feet 23 pounds of steel, 6.014.631. of objections, there are many points in avor of the use of such steels for bridges, total is steel. There were used in its constant similar structures. If this is true of a steel as hard as .50 carbon, it is evident that a mild steel having all these properties will be still more applicable to these purbless. Mr. Adamson admiarbly sums up the sum of the steel was used for the arches for the wind trusses and skew-backs. pounds of wrought iron and 513,686 pounds of cast iron. The steel was used for the arches, and the wrought iron for coupling the arches for the wind trusses and skew-backs. The metal in the Brooklyn Bridge, so far as it has been put in, is all steel, with the exception of the anchors; 6000 tons of iron, however, had been asked for at the time work was suspended. Should it be resumed, steel may be used instead of iron.

In these two bridges the steel used was in the form of plates or wire, not in what may be termed structural shapes; so that the Glasgow Bridge is not only the first all-steel bridge in the country, but the first in which

" HAY" STEEL TESTS

Compressive Test No. 1.

CHICAGO, July 318t, 1878. Strut composed of 4 angles  $2\frac{1}{2} \times 2\frac{1}{2} \times 5$ -16 in. = 1.465 sq. in. each. Total 5.86 sq. in. Buckled with 420,000 pounds total strain = 71,672 pounds per sq. in. No rivets broken, one of the lattice bars broke across

The following illustrations (Figs. 1 and 2) show the strut before and after the test.

Compressive Test No. 3, July 31st, 1878. Bar 11/4 x 11/4 in. x 3 in. long, sq. ends, with 210,000 pounds total strain, or 134,600 pounds per sq. in., was crushed as per sketch (Fig. 3).

Test No. 5, July 26, 1878.

Bar, 5 x 1 9-16 in. x 6406 sq. in. Pin, 3% in. (See Fig. 4.) 307,408 pounds total; 48,000 pounds per sq. in. Elongation, 65-48,000 pounds per sq. in. Elongation, 05-1000 in. Permanent set, 0.003. Was strained to 90,000 pounds per sq. in., when testing machine broke. Elongation in 3 ft. — 2 ½ in. 576,000 pounds total strain. Put in machine again, gave following result: Elongation in addition to above, 5-16 in. Total, 2 15-16 in. Ultimate strain, 588,000 rounds total, or 0.1760 pounds per sq. in.

Test No. 0, July 20, 1979.

Round bar, 3/-inch diam.—0.442 sq. in.
(see Fig. 5). Distance between witness
marks, 24 in; total strain applied, 21,216;
strain per sq. in, 48,000; permanent set,
none; ultimate strain, 47,000 pounds total,
or 106,335 pounds per sq. in.; elongation in
2 ft.—13/4 in.; bar broke outside of witness

Test No. 10-Tension-Aug. 5, 1878. Bar 1-inch round—0.785 sq. in. sectional area, with upset ends, as per sketch, (Fig. 9.)

sq. inch.	18 inches.	Det 111 10 111
50,000	r-32 in.	0
51,000	******	traces.
52,000	******	******
53,000	3-64 in.	x.64 in.
60,000	*****	*******
80,000†	9-64 in.	1/2-fn.
80,000	******	9.16 in.
96,600§	2 23-16 in.	
* Applied	to times on the bar di	ld not increase

† First application. ‡ After 11 applications of 80.000 pounds. § Total permanent elongation after break

Elastic set 53,000 lbs. per sq. in.; ultimate strain—96,600 lbs.: elongation—10.1 per cent.; diameter of section at fracture—14 in .: reduction of area at fracture-44 per

Tensile Test No. 15, Aug. 10, 1878-Made at a Temperature of 8 Degrees Below Zero. Rolled bar, I in. round—0.785 sq. in. sec

Rolled bar, I in. round—0.785 sq. in. sectional area. Temperature, 8 degrees below zero. (See Fig. 10.) Broke outside of the cold mixture, with 78,000 lbs. total strain, or 99,360 lbs. per sq. in. Break and elongation shown in Fig. II. Maximum elongation, 1½ in. in 12 in.—13½ per cent.; minimum elongation, 13-16 in. in 12 in.— 6% per cent.; diameter of reduced section at fracture = 13-16 in . . at fracture — 13-16 in.; area fracture — .518 sq. in.; reduction at fracture — 34 per

Tensile Test No. 18, Aug. 12, 1878-Made at Low Temperature.

Eye bar, 3 x 1 1-64 in.—7 ft. 5-16 in. C to C of pins; hammered from bar, 6 x 1½ in. and annealed. Sectional area of bar — 3.05 sq. in. Head, 7 in. wide; pin, 3 in. diameter; temperature, 6 degrees below zero. (See Fig. 12.) Strained to 48,000 lbs. per (See Fig. 12.) Strained to 43,000 los. per the municipality of Faris sq. in., no permanent set; 52,000 do.; 54,000 by the Jablochkoff electric coo do.; 55,000 do., 1-16 in. in 5 ft.; 94,400 do., broke 11 in. from pin center. Elongation of pin hole — ¼ in. (See Fig. 13.) Français, and some other Size at point of fracture, 2 15-16 x 31-32 in. clusters of lamps, would reduction at fracture — 7 per cent.; aver-

itself when steel has been spoken of for structural or bridge purposes. We refer to the impossibility of getting a perfect eye or tension bar, the trouble being in forming the enlarged ends of such bars. The usual manner of making these enlarged ends, either in iron or steel, is to weld extra metal to the ends of the bar, and then hammer out the ends to the size required. But this welde ends to the size re ing is but rarely well done, and while ap-parently a good weld on the surface, the metal is oftentimes but poorly united inside. To overcome this objection, it is necessary to roll the entire bar with enlarged ends from the same billet. Mr. Andrew Kloman has perfected and patented a mill for making a solid eye bar from one billet. Hi patent covers the bar as well. He is now able to furnish in iron or steel what is claimed to be the most perfected eye bar ever made. The bar has a finished head, only needing the primals to be drilled, when it is ready for the structure. Messrs. Hussey, Howe & Co. have arrangements with Mr. Kloman to furnish these solid eye bars to the trade.

A new Monetary Unit in Austria.—A circular has been issued by the Treasury Department, making the eight florin gold piece the monetary unit of Austria, instead of the silver florin, as heretofore. This will require the invoices of merchandise shipped from Austria to this country, purchased in the depreciated paper florin, to be certified by comparing the value of the paper with that of a gold piece, instead of the silver florin, and will relieve the trouble for some time existing by which Austrain imports appear to have been considerably over-valued.

Mr. L. Cernesson has made a report to the municipality of Paris on the illumination by the Jablochkoff electric light, from which it appears that the cost of lighting the Avenue de l'Opéra, the Place du Théâtre Français, and some other streets, with 156 clusters of lamps, would cost almost four Metals.

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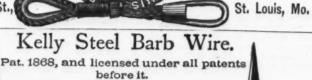
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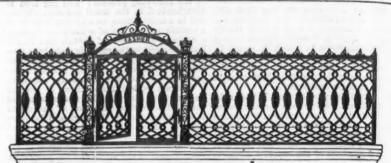
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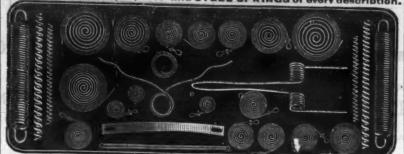
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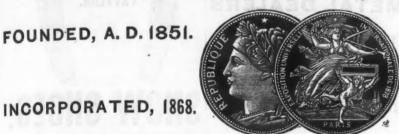
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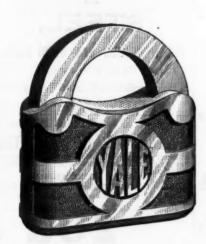


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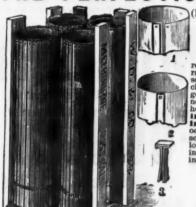
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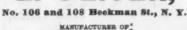
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Since then we have all learned something about art in its relations to commonplace things; and not we alone, but the great mass of those who buy and use stoves. We have had our Centennial, and within five years we have witnessed the growth of a popular demand for whatever combines heaver with utility which has estimated. a popular demand for whatever combines beauty with utility, which has stimulated the progress of industrial art in a wonderful degree. In their strivings after higher standards of beauty and artistic excellence, our manufacturers have followed, rather than led, public opinion. Their progress had been in a great degree forced upon them. For example, no market is more sensitive to the requirements of the public taste than the dry goods market, and if we compare the patterns of cheap dress goods popular a few years ago, as preserved in those interesting mosaics which housekeepers call "patch work," with the popular styles and patterns of to-day, we see that the public taste has been educated to a very correct conception of the beautiful and apthe public taste has been educated to a very correct conception of the beautiful and appropriate in patterns for fabrics. The atrocious chintzes of our grandmother's days, covered with peacocks and cabbage roses, are things of the past; the prints of to-day are, in many instances, works of art which may be studied with pleasure and profit, and in the designing of which the best available talent has been employed. If the people still wanted peacocks and cabbage roses, the calico makers would furnish them; that they do not is shown by the brief duration of the styles in which their revival was at tempted about a year ago. Good taste tempted about a year ago. Good taste turned up its nose at the "Dolly Varden" prints which a few years before would have been considered very pretty.

WALL DECORATION.

A similar development is seen in a com-parison of carpets as we have them, with parison of carpets as we have them, with carpets as we remember them; in wall papers as they are, and as they were as late as five years ago; in cheap pictures of all kinds as they are found to-day in print shops, and as they used to be when we were boys; in the furniture and upholstery of this and the last generation; in mantel ornaments; in china and glassware—in short, it is a mistake to it or a more thing area in stores. It is a hyiin everything, even in stoves. It is obvi-ously impossible for me to illustrate these remarks by showing many examples of old and new styles; but through the kindness of Robert Graves & Co., of New York, I am ously impossible for me to illustrate clase remarks by showing many examples of old and new styles; but through the kindness of Robert Graves & Co., of New York, I am able to show you two styles of wall papering which I think will interest you. The one represents fairly the class of papers which, five or six years ago, constituted the bulk of the production of this house. It is even better than the average of that time in design, and this particular pattern had a greatment made up of the papers which now constitute the bulk of a vastly greater production than was necessary five or six years ago. Grom an inquiry concerning the net result of this change, I learn that the business has not only increased enormally, but that it is more satisfactory and more profitable. These new styles of papers are making for themselves a market which haver before existed, and which could not be reached by such papers as that first shown. They are displacing paint and fresco work, and rendering wooden wains the production of their beauty, would have been content with white walls. It is unnecessary the public and costly paneling unnecessary. People are buying them who, but for the temptation of their beauty, would have been content with white walls. It is unnecessary there have been been content with white walls. It is unnecessary that he had nonservative tendencies, who are most likely to consider this address impractical and to smile at the idea of building stoves on high are principles, are the very ones whom we find striving to make each new stove more attractive than any other in the market; and a compared with the old camel-backed fireboxes (three the ton), which they used to day are marvels of beauty. Why this progress? Simply because the public taste has called for it. As the rule, an ugly stove is mow, leave or manufaction to the pattern makers, who is more often a mechanic than an artisan.

HAPFROPPHATET ORBAMENTATION.

While I cannot say that many, if any, of the stoves new in the market can be considered and the extensio

Taste and Art in Stove Ornamentation.

At the last meeting of the National Association of Stove Manufacturers, Rochester, Jan. 18, Mr. James C. Bayles delivered the following address, illustrating it with a number of interesting exhibits:

Five years ago Mr. Benn Pitman, whom many of us remember pleasantly, addressed this association at its first Albany meeting, on the subject of the legitimate function of ornament as applied to cust-iron surfaces, I have always regretted that his remarks and the drawings shown by way of illustration, could not have been preserved in your published reports for reference. I remember that at the time they made but little impression—the comment being that theories were all very well in their way, but that a man did not need to be long in the stove business to find out that the people who bought stoves cared no more for artistically were all earned to be considered his ideas impracticable were not far wrong. His only mistake was that he spoke five years too soon. If we failed at that time to appreciate his nice, but obvious, distinctions between legitimate and illegitimates stove decoration; to discern the reason why the forms commonly used should be conventionalized, if used at all, or understand why abunch of grapes is out of place on a stove leg, or a design of birds and flowers grotesque on an oven door, it was our fault and not his.

FIVE YEARS' PROGRESS IN INDUSTRIAL ART. Since then we have all learned something about art in its relations to comments, hough its of the relations to comments. ornaments, though less objectionable than living forms, are as much out of place on hot metal plates as flaming torches and burning houses would be, if printed in warm colors on light fabrics for summer wear. Wreaths, festoons, medallions containing profiles in relief, Cupids, leaves and flowers treated relief. Cupids, leaves and flowers treated naturally, great ugly monograms, staring nickel panels and name plates, and a dozen other violations of good taste which might be mentioned, are what one sees in looking over the stove catalogues for 1878. There has been progress, without doubt, but it is still hampered by false traditions, and limited by a mistaken notion of the popular requirements. Take a dozen of the best parlor stoves of to-day, stand them in line and constoves of to-day, stand them in line and constoves of to-day, stand them in line and con-template them as objects to be criticised from an artistic standpoint. What are stoves of to-day, stand them in line and contemplate them as objects to be criticised from an artistic standpoint. What are they? Things to be tolerated during cold weather, but, in the first warm days of spring, to be banished, with a sigh of relief, to the garret. They may be all good stoves—strong heaters, economical of fuel, easily managed and generally convenient—but they are essentially ugly, and when surrounded with beautiful objects, they are as much out of harmony as a fish-horn in an orchestra. Consequently, we never find stoves considered as anything better than a necessary evil. The housekeeper with an eye for the beautiful would rather suffer the discomforts of the open fire than tolerate the stove, and even in cheap houses stoves are discarded whenever it is possible to depend upon other and less unsightly, even if less healthful, heating apparatus. I believe the time is not far distant when the stove will regain the place it has lost; when it will once more become a desirable article of parlor and chamber furniture, and harmonize with tasteful and beautiful surroundings; but it will be when the stove maker is fully in sympathy with the art development of his time, and when he has learned more than he now knows of the capacity of the materials which he can employ.

THE DECORATIVE VALUE OF BLACK.

And here let me remark in passing, that it is a mistake to suppose that because iron is black it cannot be cast into objects of is black it cannot be cast into objects of beauty. People are only just beginning to appreciate the decorative value of black as a foil to color—the bass chord of color harmonies, if you please. I have given you an illustration of what can be done with black in wall treatments. Ebonized wood is the material out of which much of the best cabinet work of the day is made. We find black cabinets and side-boards, black furniture and black moldings prized as the in-

unsaleable in any market where the buyer can choose from among those which are graceful and pretty in form, and the competition between makers will continue until, like the calico printers, they employ artists to make their designs, and not, as now, leave ornamentation to the patternmaker, who is more often a mechanic than an artisan.

INAPPROPRIATE ORNAMENTATION.

While I cannot say that many, if any, of the stoves new in the market can be consid-

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chased for use in the pattern shop, only to fail lamentably in the foundry. There is a reason for this, It is almost impossible to produce in cast iron a copy of repoussé work which shall be anything more than a burlesque, and this applies to copying such work by any kind of casting. The nature of the work is such that, when a casting is made from it, the inevitable slight loss of sharpness spoils the work. It has wholly lost its expression. Another thing must be kept in mind. A design which looks well in a light-colored metal like silver, nickel or tin, is likely to become heavy, dull and uninteresting when reproduced in a black metal like iron. The design must be suited to the metal, or the design must be suited to the metal, or the effect will not be good. Many of you will remember the beautiful cast-iron pavilion of Barnards, Bishop & Barnards at the Centennial. To me it was a revelation. It tennial. To me it was a revelation. It would be difficult to imagine a better adaptation of design to material, and the effects were so good that I was deceived into supposing that the castings, as castings, were beyond comparison with any work which beyond comparison with any work which could be done by American foundries. Not long ago I had the opportunity, in company with a gentleman prominently connected with the stove trade, of examining some of these castings, and we could not suppress a laugh when we saw what rough things they were. Probably there is not a stove foun dry in the United States where such castings would not have come to the scrap heap. dry in the United States where such cast ings would not have gone to the scrap heap, but they were works of art, nevertheless, and the art was all in the design. If we had such designers as Barnards, Bishop & Barnards are able to command, I do not hesitate to say that there is not a stove foundry in the United States, represented in this association, in which smoother and finer castings could not be made than Barnards. castings could not be made than Barnards, Bishop & Barnards are able to produce.

BAD TASTE IN STOVE ORNAMENTATION. When I say that at present the tendency is o overload our stoves with ornament without any especial reference to its appropriateness or harmony, I state a fact which must be apparent to all who have studied the matter critically. If we take a first-class base apparent to all who have studied the matter critically. If we take a first-class base burner, for example, and examine it carefully, we shall see that it is entirely covered with ornament. Here we have decoration till you can't rest—literally—since there is no rest for the eye, which is wearied and bewildered by the continuous succession of ornament. This is simply bad taste. I am well aware that founders are inclined to be afraid of plain surfaces in fine work, giving afraid of plain surfaces in fine work, giving as their reason the greater ease in molding ornamented surfaces and the less likelihood of apparent defects in the finished work. If the production of perfect plain surfaces were a mechanical impossibility, there would be more force in this argument than there is; but the fact is that in this case art is prot-tituted to the convenience of the molder, and simply because of a mistaken notion that all there is of art, as applied to foundin tail there is of art, as applied to found-ing, is the fineness of the castings. Not long ago I happened into the salesroom of a foundry where only the cheapest and com-monest grades of goods are made. There was but little on the floor to interest one in search of the beautiful, as most of the work was as bad as it was cheap, and overloaded with tawdry ornament. But I saw there with tawdry ornament. But I saw there one stove which, as an art production, was, I am sure, the best of its class now made. It was a small size base burner of the cheap-It was a small size base burner of the cheap-est kind—rough, common, without one fea-ture to command it except a beauty which it evidently had by accident. The orna-mentation happened to be good; it was spar-ingly applied just where it was needed, and the effect was decidedly pleasing. There are few, if any, of our first class base burners, resplendent in ornamentation and nickel trimmings, which, if we could put them in a lathe and turn off four-fifths of their decoa-

tion, would not be improved, and would not thus denuded of superfluous finery, be more acceptable to the public than in their pres-THE BUSINESS ASPECTS OF THE QUESTION.

The answer to this will be that the counder makes stoves, not to please himself, but to sell, and that those which are most showy sell the best. This may be true, but over ornamented stoves hold their own in the market only because they do not encounter the competition of stoves which are really peautiful, and which commend themselves even to the uneducated eye as objects of art. The class of people who buy first-class

to ornament some of ms women'th productions, or go back still further for styles to revive? h an edition of John Evelyn's Diary we find an entry, under date of November 27th, 1649, which reads as follows: "Went to visit honest and learned Mr. Hartlibb, an ingenious person, who has propagated many useful things and arts. He told me of the castles which they set for ornament on their stoves in Germany, which are furnished with small ordnance of silver, on battlements, out of which they discharge excellent perfumes about the rooms, charging them with a little powder to set them on fire and dispense the smoke." Compared with small or the smoke. fire and dispense the smoke." Compared with such frills as these, how flat and insignificant appears the ornamentation of today, and if such things are wanted, how easy to meet that want by going back a couple of centuries for ideas.

In a paper of this character it is necessary

In a paper of this character it is necessary to generalize somewhat broadly, or the temptation to extend it to an unreasonable length will be found practically irresistible. I can, therefore, only hope to offer a few suggestions which have been carefully considered and which I think will be found to merit attention. It should be remembered that my remarks apply chiefly, if not exclusively, to what are known as fine and first-class heating stoves.

The luster thus imparted must necessarily detract from the beauty of the casting. It confuses the ornamentation and destroys the grace and beauty of the modeling. A dead black surface would be vastly preferable, and, if such a surface could be kept clean by occasionally wiping it with a damp cloth without danger of causing red rust spots, the labor of polishing and the bad results which follow it would be averted. A dead black surface, proof against rust and permanent, is secured by forming on the iron a coating of oxide similar in composition to magnetic iron ore, Fe. O4. This may be accomplished by what is known as the Barff process, and consists in submitting iron to the action of superheated steam. The skin of proto-sesquioxide thus formed is unchangeable, and effectually prevents rusting from the action of moisture or atmospheric oxygen. The steam must be superheated to 700° to 800° F. The length of time needed for the process depends upon the size of the articles treated. As Barff's apparatus was made for another and a very different purpose, it is somewhat more costly and complicated than need be. Its essential feature is a device for passing the dry steam through tubes heated to redness, and thence into a fire-brick chamber holding the objects to be treated. This chamber in Barff's plant is heated by a fire and flues to about 750° F., but this direct firing is probably unnecessary, as it by a fire and flues to about 750° F., but this direct firing is probably unnecessary, as it could be heated by utilizing the waste gases of the cupola. After the articles are placed in the chamber and the temperature of 750 to 800 degrees is reached, the door is luted with fire-clay, and the steam pres-sure gradually increased to 40 pounds danger of an explosion being avoided by a valve, properly weighted, and an escape pipe. Iron articles coated by Barff's process were shown at the Paris Exhibition, and were much admired for the beauty of their rich, lusterless, dead-bleck surfaces.

Another process, which gives a permanent coating of oxide, called by the French, bronzing, and applied by them to ordnance, small arms and many other articles, employs hot air instead of dry sterm. In other respects the processes are very much danger of an explosion being avoided by a

er respects the processes are very much same. The coating produced on articles of iron subjected to a temperature of 536° F., is said to resist emery paper and dilute sulphuric acid. The color of the coating obtained is greenish black, like that of old bronze. I will not detain you with details bronze. I will not detain you with details of the plant necessary for these processes, but should be very happy to give fuller information to any one who may be interested. If the results are desirable as regards stoves, the cost of either process is not great enough to deter any manufacturer from using both if he should desire to. It should be remembered that the surfaces thus obtained are unchangeable, and that they thus obtained are unchangeable, and that they will never need other cleaning than the re-moval of dust with a cloth.

BRASS AND BRONZE TRIMMINGS AND ORNA

The use of nickel trimmings is objectionable. The cold blue-white color of nickel neither harmonizes nor pleasantly contrasts with the black it is intended to relieve. It with the black it is intended to like is discolored by heat and sulphurous gases, is discolored by heat and sulphurous gases, we have two and is generally a nuisance.

substitutes for nickel as a coating for plates
and trimmings—copper and brass. Copper substitutes for nickel as a coating for plates and trimmings—copper and brass. Copper is one of the easiest and cheapest of the metals to electro-deposit. Treated with proper acid and alkaline solutions, it can be made to resemble any shade of bronze, and bronze panels and trimmings would be exceedingly beautiful, as well as novel. I have long wondered why copper was not so used, especially as its employment entails no practical difficulties, and the conversion of a nickel into a copper-plating plant demands only a into a copper-plating plant demands only a tank to hold the copper solutions and copper anodes. Brass plating is a comparative novelty. It is only lately that entirely satisfactory results have been attained in the electro-deposition of this alloy which, next to gold, is the most beautiful of the metals. Brass plating demands a good solution and careful manipulation, but it is not expensive, and could be employed with most excellent

effect in stove ornamentation. TILES

As stove ornaments, tiles, judiciously employed, are entirely legitimate and appropriate, and may be used in a dead-black setting with as good effect as they are now employed in decorating ebonized cabinet work. It will not pay to buy them in small work. It will not pay to buy them in small lots at retail prices of importers, but they stoves at all, know and care a great deal lots at retail prices of importers, but they more about beauty than is commonly supposed, and when it is offered them they will quantity by manufacturers using them.

posed, and when it is offered them they will recognize and buy it.

If I am wrong in this, and if, as some manufacturers profess to believe, the public want "frills" for their own sake, why has there been any attempt at art progress? Why not return to the ideas of the venerable Smith, who used mirrors and glass girandoles to ornament some of his wonderful productions or on heads still further for sives to go heads and might, with propriety, be relegated to mount an ornament like a cap sheaf on top of a stove, it should be ornamental. originally borrowed. If it be necessary to mount an ornament like a cap sheaf on top of a stove, it should be ornamental. During the past year we have witnessed some radical departures from the conventional idea in the matter of urns. I should not like to sav what I think of some of the devices substituted, but there is certainly room for further improvement. Something light and pretty in broave or barse alternation. light and pretty in bronze or brass plate would be appropriate.

THE NEED FOR DESIGNERS.

I might add to these random suggestions I might add to these random suggestions until I had quite exhausted your generous patience, and all my suggestions might merit consideration. But more than all these together is needed before we can have a real and substantial progress in the application of the laws of art to the manufacture of stoves. We need good designs, and this implies good designers, who are not only educated in all matters of taste and technique, but are thoroughly familiar with the manufacture. but are thoroughly familiar with the ma-terials available and know the limitations of the molder's art. Here we are met by a practical difficulty. We have no such designers, and the field is not one which offers any inducements to talent. During the fiscal year 1878, 14,000 patents were granted for mechanical inventions and only merit attention. It should be remembered that my remarks apply chiefly, if not exclusively, to what are known as fine and first-class heating stoves.

Surface finish of Castings.

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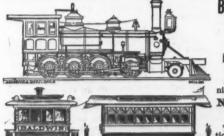
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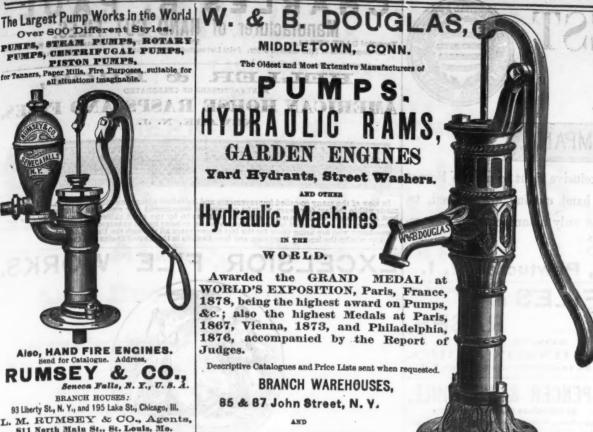
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law. The statute needs no amendment, but it needs a clearer and more consistent interpretation, and this will be reached when, with the development of industrial art in this country, designs become more valuable and more effort is made to protect them. It has been commonly believed that a design patent was of no value beyond preventing a close imitation—in the case of stoves, making illegal the use of one manufacturer's platers as patterns in another manufacturer's foundry. It should need no argument to show that if this be all there is to a design patent, such a document is not what the law intends it shall be. Has it ever occurred to you, gentlemen, that the enormous annual expense which the enterprising stove founder must assume on account of patterns is very largely, if not wholly, due to the fact that, in order to keep ahead of his competitors, he must discard his old ideas, however good, because everybody has adopted them, and strike out in new directions in order to enjoy, for a brief season, the benefit of having something distinctively new and original, even if a trociously bad, to talk about? Have you ever thought how different, and more satisfactory, the stove business would be if there were no poaching on each other's preserves, and if every manufacturer found it profitable to work out new ideas of his own and cling to them, if good and popular, as long as they were profitable? In view of the present uncertain status of design patents, these are suggestions which may furnish food for profitable thought.

DESION PATENTS.

Everywhere about us we find evidences. DESIGN PATENTS.

Everywhere about us we find evidences of a great art awakening. Schools of design are multiplying, and industrial drawing is gaining a foothold as a part of the common school course in our principal cities. Massachusetts has taken the lead, and is educating designers and artisans whose work, a few years hence, will make American manufactures as famous for grace and beauty as they now are for honesty and utility. If we are to reap the full benefit of this movement, and encourage those who have the talent to devote it to the work of designing, we must see to it that those who designing, we must see to it that those who buy this talent shall own its fruits. I know buy this talent shall own its fruits. I know, gentlemen, that in venturing upon the discussion of this subject I am treading upon thin ice. This is not my fault, however, since no one can differ from me on the point without quarrelling with his own interests. I know that, in the excitement and passion of legal conflicts, men often lose sight of underlying principles and push for victory, even though its after consequences be tenfold more disastrous to them than those which would have followed defeat. This is as much to be expected as it is to be This is as much to be expected as it is to be be regretted; but when the smoke of battle shall have blown away and passion given place to calm reflection, consider whether every motive of enlightened selfinterest does not prompt you, of all others—you whose products are saleable in proportion to their attractiveness and utility—to do what you can, individually and as a na-tional association, representing an industry tional association, representing an industry of national importance, to secure such an interpretation of the law as shall give design patents a definite, specific, recognized value When this is done we shall become a nation of art workers, and the inspiration of beauty will pervade all departments of industry and glorify even the common-

Our Commercial Relations with Russia.

The following is from Mr. Wickham Hoffman, of the Legation at St. Petersburg, to the Department of State: While the amount of American products

and manufactures imported into Russia has very much increased within the last few years and is constantly increasing, these articles are no longer brought here in Amer-ican vessels. The same causes which have crippled our merchant marine elsewhere-the introduction of steam and the use of

ron in shipbuilding—have affected our direct trade with Russia.

Other general causes have led to the same result. The accumulation of capital, the telegraph and the railway here changed the telegraph and the railway here changed the course of trade. Very rarely now does the Russian merchant write or telegraph to New York for cotton, or petroleum, or dye woods, or any other Amercian product he may want. In the free ports of Hamburg and Luebeck, and the substantially free port of Liverpool, immense stores of these articles are kept in depot. The Russian buyer telegraphs to one of these 'free ports, and in a few days his order is filled. He thus avoids the danger of a fall in the market, and of

Great Britain seems to have nearly the monopoly. You meet them in great numbers in the Baltic and elsewhere in European waters—steamers burning 6 tons of coal a day, making 6 miles an hour, the crew consisting of captain, two mates and 8 seamen, engineer, assistant, and 4 firemen; the heavy work done by machinery, donkeys and derricks; iron decks, and patent hatches. Such vessels cost very little in England, and are sailed at a very slight expense. Coal is to be had in bond at prices very little above Liverpool prices, at almost any port of Europe. Such vessels coald depend upon no direct return cargo from Russia.

An occasional cargo of hemp from Riga for our navy, and some few of flax from

the general causes I have indicated, the poverty of the land owners, the cheapness of labor, and their prejudice and ignorance, interfere with their sale, and very few are at present in demand.

Street cars are very much liked here, and there is a demand for them, which I think might readily be increased. They are far neater and lighter than the other street cars built generally at Copenhagen. They are dearer, but experience shows that they are so much better built, and kept in repair

are so much better built, and kept in repair at so much smaller annual outlay, that there is a strong disposition to use them. The expense of sending them here is considerable. They should be shipped only in summer, for they are carried upon the deck of the steamer, housed in. The Wilson line brought some of these cars to Russia last summer, transshipping them at Hull.

A large trade is done in Lake Superior copper, especially at the present time, and at remunerative prices. It is important both in the shape of brass for cartridges and in the pig. I think that our Lake Superior copper must always be in great demand here for this purpose. We may be said to have a monopoly of the article, for there is no other yet discovered that has to such a other yet discovered that has to such a degree the qualities of lightness and tough-ness, so essential for the cartridge shell.

This trade ought to be developed.

A very large amount of cotton is brought A very large amount of cotton is brought to Russia, both to the ports of the Baltic and Black Sea. It comes, as I have said, from the great entrepôts at Hamburg and elsewhere. But I am told that the Egyptian is gradually superseding our own. It is shipped in better order, and its quality is yearly improving, while ours is deteriorating. Our cotton goods are not sold here. They pay duty by weight, and consequently. They pay duty by weight, and consequently their very excellence in the quantity of cotton they contain excludes them.

Locomotives have been built from time to time in the United States for Russia, for some years past, and lately 40 were shipped from Philadelphia. They are so much bet-ter than those built in Europe, and especially in Germany, where Russia generally orders her locomotives, that the government and the companies are generally ready to pay something additional in price. American locomotives do not require one-fourth the expenditure in annual repairs required by the German. It of course needs a large capital to fill a contract for 50 locomotives, but the government banks here willingly come to the aid of the contractor for a consideration, and through them the contract can be carried out. I know of no reason why we should not supply a large number of locomotives yearly to the Russian railroads, at an average profit of about \$2000, say 15 per cent.

Labor-saving machines of all kinds would sell well could proper measures be adopted for exhibiting them here and in Moscow. But for this purpose our machine shops must combine and send out specimen machines with engineers to run them. Then hire a locality and provide power. Establish, in fact a sort of permanent exhibition. Sew-

York for cotton, or petroleum, or dye woods, or any other Amercian product he may want. In the free ports of Hamburg and Luebeck, and the substantially free port of Liverpool, immense stores of these articles are kept in depot. The Russian buyer telegraphs to one of these free ports, and in a few days his order is filled. He thus avoids the danger of a fall in the market, and of keeping a larger stock on hand than his immediate wants require. He receives besides very great advantages of credit. These wealthy depots give him liberal time for payment, for which in Russia he can readily pay 8 per cent. A transaction which is to the advantage of the seller too, who can readily borrow money in the free ports I have named at 4 per cent., while the danger of loss from bad debts is very small; for I am informed by an American merchant who has resided here for many years, that one per cent. per annum is a fair average loss for bad debts in contracts with Russian merchants. You see, then, that very large supplies of American products may be consumed in Russia which in all commercial reports are credited to Germany or to Great Britain.

The question then arises, Is it possible for us to regain this direct trade? I fear not. Capital and propinquity must bear their fruits. If the effort is so be made, it appears to me it must be by means of small, cheap, iron steamers, a class of vessels of which Great Britain seems to have nearly the monopoly. You meet them in great numbers in the Baltic and elsowhere in Europ.

Our tools (shovels, spades, axes, hatchets, dec.) are all very well liked, but are found



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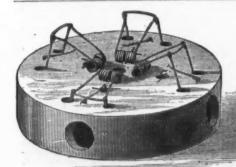
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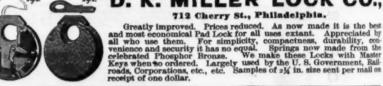
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Scientific and Technical Notes.

In a recent number of Dingler's Poly. MARKA'S HOT WATER INJECTOR FOR LOCO MOTIVES.

exhibited at the Paris Exhibition, in con-nection with Kirchweger's apparatus for heating the feed water by a portion of the exhaust steam. The latter consists of a bifurcated exhaust pipe, so arranged that a portion of the exhaust steam is directed from the Llast nozzle and conducted to the from the blast nozzle and conducted to the tender. Now, it has been impossible hitherto to take advantage of the saving effected by heating the feed water, because the ordinary injectors will not work unless the feed water is at such a temperature that it does not get raised by the condensation of the steam used in working the apparatus to a temperature more than 212 degrees, or to the temperature at which ebulition takes place under ordinary atmospheric pressure. Mazza effects the working of the injector Mazza effects the working of the injector under pressure, the suction pipe of the injector communicating with a closed chamber on the tender, and the overflow pipe being fitted with a spring loaded valve, the load on this valve being about 30 lbs. per square inch. This combination of apparatus has been at work on the Alta Italia Railroad for more than a year, and the record of 11 months showed a saving of about 14 per cent., due to the use of hot feed water. Mazza effects the working of the injector

From a long series of experiments on

ELECTRO-CHEMICAL ACTION UNDER PRESSURE varying from 100, 200 to 300 atmospheres and upward, M. Bouvet arrives at the fol-lowing among other facts: The decomposi-tion of water by a current is independent of pressure. The quantity of electricity necespressure. The quantity of electricity necessary to decompose a given weight of water is sensibly the same, whatever the pressure. Oxygen and hydrogen, whatever the pressure, are liberated with equal facility. Whether they are produced in one test tube or in two, there are no secondary phenomena average decomposition even partial as has causing decomposition, even partial, as has been believed hitherto. When united in one test tube, even at a considerable pressure, and though forming a detonant mixture, they do not offer any danger in handling.

We are indebted to Mr. H. Simon for a pamphlet descriptive of

HILP'S SYSTEM OF WROUGHT IRON PERMA NENT WAY FOR RAILROADS.

Though not directly applicable to the peculiar circumstances in this country, the matter possesses importance as affecting the iron and steel industries of Great Britain and the Continent. Hill's improved system of permanent way consists in the employment of longitudinal sleepers of rolled iron, to which the rails are connected by screw bolts, in combination, however, with cross sleepers also composed of rolled iron. The cross sleepers are arranged either under the joints of the longitudinal sleepers, in which case the fish-joint of the rails will be over the cross sleeper, or one cross sleeper may be employed at each end of each pair of longitudinal sleepers, leaving the necessary space for packing with ballast between the two adjacent cross sleepers. case the joints will be what is generally called suspended joints, same as now mostly employed in ordinary permanent way. It was first introduced on the line between Ems and Wiesbaden, Germany, and has

since made rapid progress in Prussia, Austria, Bavaria, Alsace, Lorraine and Belgium. A correspondent of the Railroad Gazette nnounces that by the use of

PARAFFINE AS A LUBRICANT,

the Erie Railway has considerably reduced the Eric Railway has considerably reduced its oiling expenses on passenger-car journals, and has reduced the number of hot journals from 535 to 382. It is now used during the winter months without the addition of any other oil, but it is found that in summer it becomes so limpid that it is hard to keep it in the arise horse. During the summer. in the axle boxes. During the summer months it is, therefore, mixed with some other lubricant to give it more "body."

The English Mechanic describes a simple

POLISHING METALS WITH EMERY.

It consists of two longitudinal bars of wood

A curious instance of the

MINUTE CAUSES WHICH APPECT EXPLOSIONS was given recently by St. Claire Deville, as observed by Prof. Abel. About .2 grain of chloride of nitrogen is placed in a watch glass and exploded with a piece of phosphorus; the noise is tremendous, but the explosion has little or no shattering effect. Now repeat the same experiment, after having breathed on the chloride so as to deposit a thin envelope of moisture (which cannot be more than a thousandth of a millimeter thick). In this case the explosion is less noisy, but the effects are quite different. Not only is the glass pulverized, but the table supporting it is perforated.

A German firm is manufacturing MINUTE CAUSES WHICH AFFECT EXPLOSIONS

WOVEN STEEL WIRE BELTING,

which they claim to transmit power well, to operate without lengthening, and to run smoothly because there is no overlapping at any place. The spirals of wire are woven across the belting, so that three, four or more spirals form one link. The space between two links is, besides, filled up with a cross-piece, so that the closely woven netting of spiral wire forms a band of great strength and flexibility. It is faced and lined with rubber or leather.

In the Amaden der Phusik. The won Jolly which they claim to transmit power well, to In the Annalen der Physik, Th. von Jolly

writes on the use of the

of the pans of which is at a greater distance from the center of the earth, must show a corresponding difference. Mr. von Jolly has actually found, with a difference of hight of pans of 17 feet, and a weight of 1 kilogram, a difference of weight of 1.5 milligram. According to the law of gravitation, the difference ought to have been 1.652 milligram. If a balance were mounted in the same way, and a leaden ball placed near the lower pan, a corresponding increase of the weight on the pan would be produced. Based upon the figure given as the average density of the earth, it would be possible to ascertain the diameter of a sphere of lead which would cause an increase of 1 milligram for one kiloan increase of r milligram for one kilo-gram. This could be again used for ascer-taining the average density of the earth.

A novel construction has been recently described in Engineering as having been em-ployed in the Dysdale Viaduct, on the rail-road from Christiania and Fredrikshald, carrying a single rail over the Dyse brook.

ROCKING PIERS FOR VIADUCTO

are intended to protect the structure from the effects of expansion and contraction, due to alterations of temperature. The piers which support the superstructure are of wrought iron with lattice-work web. In the longitudinal direction of the viaduct, which is some 603 feet in length, there is only a single column between each span, possessing no stability in itself, and the upper end is allowed to more along with the allowed to move along with the superstruc-ture when the latter expands and contracts. ture when the latter expands and contracts. The lower end of each pier rests on a hinged shoe, so that breaking strains are avoided, and the load is always rendered central to the pier columns. The movement of iron work in a longitudinal direction is transferred to the one abutment on which are the necessary bed plates, provided with rollers; on the other the superstructure is kept in place by a fixed shoe. With this arrangement, it is stated that no special expansion place by a fixed shoe. With this arrangement, it is stated that no special expansion joint in the rails is necessary, as the sleepers and platforms are quite independent of the expansion and contraction of the ironwork.

A new regulator for electric light produced by the burning of carbon points, is the SIEMENS & HALSKE LAMP.

which may be called a modification of the Serrin type. The two carbons, both up-right, are hinged at their lower ends so that they fall toward one another. The necessary distance between their upper extremi-ties is maintained by a rod of some refractory substance interposed between them. This rod is moved in a vertical direction by a lever arm, which, in its turn, is controlled by an electro-magnet. The passage of the current through the electro-magnet and the carbons tends to thrust the refractory rod upward and to separate the carbons. If, however, the current becomes too weak, the

rod drops and the carbons approach one an-other correspondingly.

A very interesting historical fact has been brought out, in a paper read at the last meet-ing of the English Institution of Mechanical Engineers, by Mr. H. A. Fletcher, on the

HESLOP ENGINE.

HESLOP ENGINE,
a remarkable and ingenious form of steam
engine, invented by Adam Heslop, and
patented by him in 1790. This engine, which
contained the germ of the compound system,
was little, if at all, known outside of Cumberland. Out of 15 engines, of which there
are tolerably full records, only one specimen
now remains, and that is stopped and has been
sent to South Kensington. The Heslop engine has two open-topped cylinders, called
respectively the hot and cold cylinder, one
on each side of the main center of the
beam; both are single acting, their pistons
acting in the same direction. The steam, acting in the same direction. The steam, on being admitted into the first or ho cylinder, helps to raise the piston by its pressure underneath; the return stroke is then made by the weight of the then made by the weight of the mp-rods, &c., in the pit, suspended pump-rods, &c., in the pit, suspended by a chain working over an arched beam-head. During the down stroke of the pump-rods, the reduction valve being opened, the steam passes from the hot cylin-der to the second or cold cylinder by means of a compecting, pipe constantly impressed of a connecting pipe constantly immersed in cold water, which produces sufficient condensation to "kill" or reduce it to atmosat one of the longitudinal edges. The surface of the bars, the section of which is
made to correspond with the work to be
done, is covered with a sheet of cloth, paper
or other flexible material, coated with
emery. The cloth is fastened and stretched
tightly by being pierced by studs attached to
the flat surface of contact.

A curious instance of the pheric pressure as it enters and fills the cold cylinder. The cold piston having arrived The two pistons are heavily weighted in equilibrium, probably to keep the chains taut, and the action of the steam in the hot cylinder simply takes off the weight of the hot piston and allows that of the cold piston

A German, Mr. Pintsch, has invented a system of illuminating railway cars, which has recently been applied with much success in England in

ILLUMINATED BUOYS.

The buoy is made the recipient for a large body of compressed, rich and heavy gas, produced by distilling shale or any fatty material. An ingenious regulator provides for the regular supply of the lamp, which will burn three months, night and day, with only one filling, the light being visible at a distance of about four miles. There is, however, in avistance an electric lighting. distance of about four miles. There is, however, in existence an electric lighting apparatus which might be employed, so that the light could be extinguished at sunrise and restored at night, giving, of course, a much longer duration to the working of the

Some time ago we drew the attention of our readers to the researches of Prof. J. Delboeuf and D. Spring on NATURAL AND ARTIFICIAL COLOR BLINDNESS

They found that by looking through a layer of fuchsine, persons afflicted with color blindness are relieved of their infirmity. A According to the law of gravitation, two equal weights, if weighed on a balance, one previously tinted with fuchsine.

PAT.OCC. 25:1871

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Agents for the BENGAL RAZORS. AMERICAN TABLE CUTLERY, BUTCHER KNIVES, &c.
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THE "PATENT IVORY" HANDLE TABLE KNIFE.

The oldest munufacturers of Table Cutlery in for Table Cutlery. A most beautiful and perfect hUTCHER AND HUNTING KNIVES. Illustrated





rer of **Pen and Pocket Cutlery**, Pepperell, Mass. s are forged by hand from the best Cast Steel, and warrant; was awarded the Gold Medal of the Conn. State Agricults lew York with E. P. Whipple, too Chambers St.

Manufacturers of FINE PEN & POCKET CUTLERY.

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Mc Coy

CLARK'S

PATENT HORSE CLIPPER price list, which we will send on application. The genuine are stamped on both the woode and metal parts, as shown in the illustration, as protection against inferior imitations.

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Washington Works, SHEFFIELD, Celebrated I-XL Cutlery, Razors,&c

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All of Gardner's Patent Knives are fully warranted.

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STEEL, Table Knives, Razors, Shovels, &c., &c., of every description.

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Having largely increased our facilities for the manuacture of these very popular goods, we offer them to trade at a large reduction from our formerices. The list price of the large size is now \$12.00 or dozen, formerly \$12.00, and the amail size, \$0.00 or formerly \$12.00. The material used in the manufacture of X oung's Patent Felding Scissors is the rety best. All are nickel-plated and furnished with

morocco case.

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Pen and Pocket Knives, Warranted made from S. & C. WARDLOW'S EXTRA CAST STEEL. Hear 71 Clinton St., SYRACUSE, N. Y.

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None genuine unless stamped

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Isaac Greaves' Best Cast Steel



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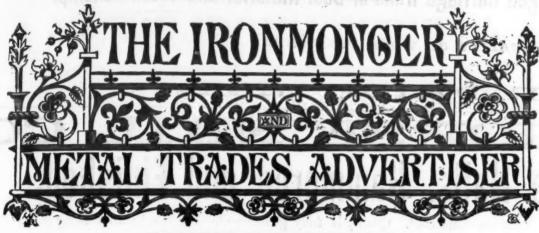
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of the world, including English, and is sent to all the countries where they are spoken, thus placing the contents of the Ironmonger not only within reach but in the native language of eighty milions of German, forty-two millions of French, twenty-eight millions of Italian, and fifty-one millions of Spanish speaking people; or, in all, over two hundred millions of inhabitants in the principal nations where the best purchasers of manufactured goods are to be found.

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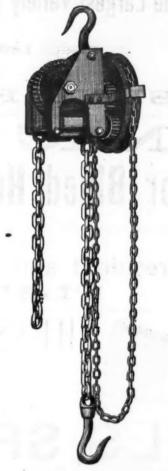
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THE WHOLE FOREIGN HARDWARE TRADE,

so far as our experience of twenty years is concerned, will be covered by THE FOREIGN SUPPLEMENT at least twice a year. Thus a Price List or Advertisement inserted in the *Fronmonger* and FOREIGN SUPPLEMENT is a strikingly powerful and most efficient way of publicity, not to be compared with any of the other ordinary channels of communication.

against the worm wheel is proportionately



The worms and thrusts present divided. The worms and thrusts present twice the bearing surface, hence the friction is not concentrated at any one point, and the strength and durability of the machine are thereby greatly increased. The chains are gauged accurately to the teeth both of the lifting sheave and hand-chain wheel, to prevent hitching and jamming when in motion. The chains are also guided through eyelet belse to their proper pretitions on the wheels. holes to their proper positions on the wheels, so that whether the hoist is lifting at an angle or is thrown carelessly on the floor, the chain cannot get snarled or come loose from its sheave. The use of a large lifting chain gives a strong tooth, and its slow motion over the lifting sheave reduces the wear. It is also claimed that a large chain is stronger than a combined lot of small chains of the same section.

The machine is very short and can readily be used for low lifts. It may also be susbe used for low lifts. It may also be suspended from wheels on a rail or beam, and used as a traversing hoist. There are no journals to twist off, and the working parts being exposed the condition of the machine can always be seen. It will sustain the load at any desired point, but will lower rapidly on being started. The construction of the hoist is simple throughout, and adapted to the attainment of a smooth running and

Deposit of Cadmia in a Coke Furnace.

We show in the accompanying cut a new hoisting apparatus recently patented by Alfred Box, and now manufactured by Alfred Box, and now manufactured by Alfred Box & Co. at the Northern Liberty Machine Works, Nos. 312 and 314 Green street, Philadelphia.

The results desired in the construction of this hoist were durability of the working parts and quickness in handling loads. To accomplish this end, the sheave of the lifting chain is a double worm wheel, driven at the lower periphery by two worms, the chain passing over the sheave between them. Each of these worms is sufficiently speeded by a gear at the extremity of its shaft, driven by the larger gear cast on the hand-chain wheel, to make a man power at that point equivalent to a ton or a ton and a half load lifted. It is the opinion of the patentee that where great weights are to be raised, it is more profitable to use another man for the time being and hoist quickly, than to have a slow-moving machine with more power. In a great majority of cases where this hoist would be employed, the power of one man would be amply sufficient to move the load with ease and rapidity. As the load is distributed on two screws, each does but one-half the work, consequently the pressure against the worm wheel is proportionately

The deposit of cadmia was formed during a 14 months' blast, the furnace having been blown in September, 1876, and blown out November, 1877. An examination of the horizontal section of the cadmia, shows it to have four prominent points directly over the tuyeres and midway between the points at which the stock was dumped in, while directly under these last-named points there is but little deposit. In either case it seems directly under these last-named points there is but little deposit. In either case it seems most probable that the position of the tuy-eres had nothing to do with the thing, but most likely it has been the distribution of the materials. The center of the ring was about 7 feet from the top of the furnace, being in its largest portion about 3 feet thick

thick.

The furnace was again blown in, running for a little less than 10 months, and after blowing out again showed a deposit of cadmia much larger than the first, and exhibiting the same characteristics in its formation, although the law was not so markedly expressed in this case. This, however, would appear to be due to the much larger size of the deposit, the tunnel head of the furnace being much more nearly closed than in the first case. Considerably more ore was used during the 10 months' blast than during the previous 14 months' blast, the output of the furnace having been greatly increased, and hence the larger size of the deposit in a shorter time.

The first deposit, on being removed from

shorter time.

The first deposit, on being removed from the furnace, was found to weigh 4 tons 6 cwt.; the second, 12 tons 4 cwt. Both deposits were sold to a zinc company, I presume for conversion into spelter. An analysis of a piece from one of these deposits resulted as follows (by Dr. T. M. Drown):

Silica 9.94 Lime 1.20 Carbon, by loss 0.67 Total 1.00 Carbon, by loss 1.

### The Landore Steel Company.

This company, which established works at Landore to carry out Dr. Siemens' direct process for the manufacture of steel from

process for the manufacture of steel from pig and ore, seems to have come to an untimely end. The Sheffield Independent of a recent date says:

Yesterday, in the High Court of Justice, Chancery Division, before Vice-Chancellor Malins, Mr. Glasse, Q. C., appeared in support of a petition for a winding-up of this company compulsorily. Mr. Higgins, Q. C., who represented the company, said it was clear there must be a winding-up order.

Mr. Glasse observed that Dr. Siemens, whose process the company, was formed to

rapidly on being started. The construction of the hoist is simple throughout, and adapted to the attainment of a smooth running and efficient tool. All the lifting strains are supported by wrought iron pins and straps; the bearings of the worm shafts are chilled, and the worms themselves constantly lubricated by running in a casing packed with oiled waste.

Mr. Glasse observed that Dr. Siemens, whose process the company was formed to work, was out of pocket in the undertaking nearly £179,000, but still believed the concern could be carried on profitably. They were large government contractors, but would be necessary to hold meetings under the Arrangement act, which could not be waste. held till after a winding-up order had been made, because there were three or four debenture holders who threw difficulties in the

Mr. Higgins, while not opposing a com-Before the Chattanooga meeting of the American Institute of Mining Engineers, Mr. Higgins, while not opposing a combination of Longdale, Allegheny County, Va., read a paper on a deposit of cadmia, or impure oxide of zinc, in a coke furnace. Such deposits, generally known as "sulphur rings," are of common occurrence in the upper parts of blast furnaces using ores containing zinc, and were very common in the charcoal furnaces of Virginia working the brown hematite ores found near the in the upper parts of blast furnaces using ores containing zinc, and were very common in the charcoal furnaces of Virginia working the brown hematite ores found near the Cadent black slate. These charcoal furnaces having, as was customary, very small tunnel heads, frequently became much obstructed by the zinc deposits, and it was a common thing for them to be blown down for the purpose of "burning out the salphur ring," it being supposed that the heat at the top while blowing down tended to remove the obstruction. How far this may have been the case does not appear, but from the persistent manner in which these deposits remain during blowing out, in the top of a reconstruction, and it was a coke furnace with which Mr. Firmstone is familiar, he should judge that but little good was done by the operation.

The furnace in which the deposit was studied is 60 feet high and 11 feet in diam-

# H. D. SMITH & CO.,

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Manufacturers of the

# BEST QUALITY CARRIAGE MAKERS' HARDWARE,

Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED.

SEND FOR PRICE LIST.

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The Saranac Nails are hammered hot and the finishing and pointing are done cold. Quality is fully guaranteed. For sale by all leading iron and hardware houses.

S. P. BOWEN, President and Secretary.

J. W. LYNDE, Treasurer.

PLATTSBURG, N. Y.



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Pittsburgh, Pa., U. S. A.



SHOVELS, SPADES AND SCOOPS.

We guarantee our

RAILROAD SHOVELS

Smooth Back Locomotive and Coal Scoops

Superior to any in the market.



SPECIALTIES:

Railroad Shovels and Locomotive and Coal Scoops.



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Wrought Iron Butts, Hinges

DOOR BOLTS, Plain, Japanned, Bronzed and Plated.

We are prepared to furnish all kinds of WROUGHT IRON BUTTS, both Common and Bright Finish. FACTORIES: WAREHOUSE

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20, 22, 24 and 26 Artisan Street, New Haven, Conn., U. S. A. Automatic Machines for Straightening and Cutting Wire of all sizes to any length. Automatic Machines for Cutting and Forming Wire in various shapes.

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SABIN MFG. CO.,

MONTPELIER, VT., Manufacturers of

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Sabin's Lever Door Springs

For Heavy Doors.

The BOSS and CROWN SPRINGS for Screen and Light Inside Doors. HENRY BROOKS & CO., 127 Milk Street, Boston General Agents. E. P. WHIPPLE, 100 Chambers Street, New York.
KELLOGG, JOHNSON & BLISS, 108 Randolph Street, Chicago.

American Improved Syringe, 18 inches long; diameter, 11/4



Brass Green-house Syringes and Pumps, Brass Tubes, Fine M kness, manufactured by HOBT. T. DEARIN & N. B.—Tubes for sliding one within the other made to order.

Northern Liberty Works, PHILADELPHIA, PA. ALFRED BOX & CO.,

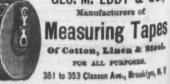
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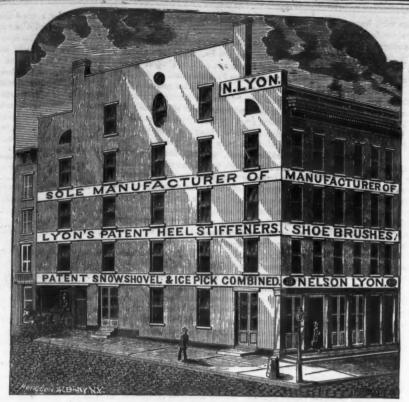
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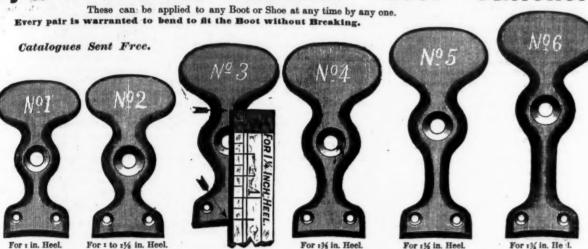
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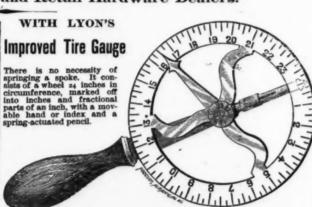
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Patent Adjustable Bolt Holder,

POLE AND Thill Coupler.

From Ten to Twenty-five Dollars a Year

can be saved in time and bolts by every Blacksmith or Wagon Maker, in purchasing one or both of above tools for holding Tire or other Bolts from turning while removing or tightening up the nut.



BLACK AND TINNED IRON RIVETS PITTSBURGH, PA., Manufacturers of every description of First Quality IVETS.

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that works without Boiler. Always ready to be started and to give at once full power SAFETY, ECONOMY,

CONVENIENCE.

Burns common Gas and Air. No steam, no coal, no ashes, no fires, no danger, no extra insurance. Almost no attendance.

THE NEW

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Hardware in Germany and Austria.

A correspondent of the Ironmonger writes to that journal as follows: The feeling of dissatisfaction with which the mercantile community looks back upon the past year, is not compensated by the prospect of the contemplated change in the customs policy of the Empire. Nearly every branch of trade has been carried en either at a loss or with the barest margin of profit, and the want of confidence restricted all trading operations within the narrowest limits. The hopes of a change in the monot-

ony that has so long prevailed, have been dashed to the ground by the new and unex-pected element of disturbance, introduced substitute protection for the free-trade policy that has, with few intervals, been perse-vered in by Prussia for the last 60 or 70 that has, with few intervals, been persevered in by Prussia for the last 60 or 70 years. It is not a little surprising that the country which was the first to give practical expression to the doctrines of Adam Smith, by the law of 1818 and the formation of the Zollverein, should be exposed to the danger of retracing its steps and of sacrificing all the advantages which a free-trade policy has secured for it. The position of affairs is, however, very simple. The expenses of the army and navy are so great in proportion to the wealth of the country, that there has been of late a growing disposition in Parliament to dispute the necessity of various items in the budgets laid before it. As the various measures proposed to meet the difficulty have been rejected, the Imperial Chancellor appears to have resolved upon one which will free him from the control of an increasingly-jealous parliament, and, as he hopes, place ample funds at the disposal of the Imperial government. All the free traders of Germany hold up their hands in astonishment that a man who has proved himself the most able statesman of the age, should contemplate a step which the experience of other countries proves to be fraught with danger. "There are experiments," said a leading merchant the other day, "which it would be criminal to make, and this plan is one of them." It has always been expected that the next move with regard to the Zollverein tariff would be the reduction of the dutiable articles to about a dozen, but the plan to be submitted to the Parliament in Berlin increases them to about 2000; in fact, duties are to be levied upon every article of foreign production which cannot be grown or manufactured in Germany. The system now prevailing is complicated enough, but it is simplicity itself when compared with the new proposal, which seems to combine all the disadvantages of fixed and ad valorem duties. The duty is to be levied by weight, but as the rate is to depend upon the quality and value of the goods. The effect upon British trade cannot f importers of foreign goods. The effect upon British trade cannot fail to be disastrous; but it seems pretty certain that the protection of native industry will prevent German manufacturers from competing with us in foreign markets as they have hitherto done. There is also a possibility of an increased demand for some classes of English goods, in spite of the high duties. A manufacturer told me the other day that as long as pigs paid duty, he used English iron exclusively, the German article being so carelessly made as to be dear at any price. The abolition of the duty had, however, such an immediate effect in improving the quality of German iron, that he now uses nothing else.

The prospects of the hardware trade in Austria are very gloomy. A Sheffield merchant who has visited the whole of Austria and Hungary for the last 25 years, informs me that the poverty of these countries seems to be so much on the increase that the demand for superior goods has fallen off considerably. For the best cutlery there is scarcely any market, and a reduction of one-half in prices would scarcely influence orders. Firms that used to buy table-knives largely at from 5/ to 13/, now only huv at 2/11 to 6/ per dozen. As the Styrian

orders. Firms that used to buy table-knives largely at from 5/ to 13/, now only buy at 2/11 to 6/ per dozen. As the Styrian cutlery at that price is superior to the English, the consequence is that, except for the use of the upper classes, Sheffield cutlery is practically excluded from the market. A large part of the prevailing distress is attributed to the drain which the universal military agarded in 1866 exercises. military service introduced in 1866 exercises on the country, the disturbing effects of which are becoming every year more ob-servable. There is also a great want of in-ternal means of communication, which pre-vents the farmers and wine-growers from vents the farmers and wine-growers from taking advantage of good harvests; and the consequence has been that during the past year a large part of the crops has rotted on the ground. The want of good roads has also a very prejudicial effect upon the use of agricultural machinery, owing to the ex-treme difficulty connected with the transport of heavy mechines. of heavy machines.

Large Output of Steel Rails.—The Pennsylvania Steel Works, near Harrisburg, have just completed an order for steel rails, which in the history of steel-rail rolling mills has never been equaled for rapid work. The rail mill, under the foremanship of Mr. Wm. Batty, during a run of nine consecutive turns, from Wednesday, Jan. 8, until Tuesday, Jan. 14, night and day turn, of 12 hours each, aggregated the enormous number of 6108 rails, weighing 1359 tons, in 108 hours, including stoppages for oiling the machinery and other purposes. To show what can be done, we give the last three turns on the order, running 36 hours, from Monday morning at 6 o'clock until Tuesday evening at 6 o'clock. The day turn run on Monday and Tuesday 720 and 756 rails, making a total of 1476 rails. In the next turn, on Monday night, 738 were made—a total of 2214 rails in the three turns, or one rail every 58½ seconds. To deduct the supposed necessary time consumed in stoppages, would allow only 56 seconds to a rail during a portion of the time. The rails were run through 13 passes, were 30 feet in length and weighed 50 pounds to the yard. When cooled they were straightened, drilled and loaded on cars as fast as made.—Token of Progress.

# The Iron Age

### Metallurgical Review.

New York, Thursday, February 13, 1879.

DAVID WILLIAMS . . Publisher and Proprie JAMES C. EAYLES -JOHN S. KING

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The State Department report the receipt of an important dispatch from the United States Consul at Amsterdam, Holland, stat ing that by "ministerial resolution" (which we understand to mean by vote of the Cab inet) the following rates of duty are fixed as part of the Netherlands tariff: "Tools "of wood, iron, copper, steel and other metals as agricultural implements and "sewing machines, are free of import du-"ties; and it is stipulated that in this ex "emption are comprised all finished tools "which serve mechanics as an aid in their "work. Further, parts of tools, such as "hammers, spades, chisels, &c., without "handles, and augers without piercers, &c. " provided they are in the condition in which "and afterward fitted for use by putting "on the handles, piercers, &c. Tools of "spelter or zinc remain dutiable, likewise "mathematical, surgical, chirugical, optical " and musical instruments." We confess we are unable to decide what is meant by

The Causes of Commercial Crises.

The theory of Prof. W. Stanley Jevons that commercial crises, of which one may be expected during every decennial period, are connected with sun spots, has been a good deal laughed at, but it is at least an ingenious hypothesis, which rests upon carefully observed phenomena. What Prof. Jevons calls his "present working hypothesis" as to the causes which produce a commercial crisis every ten years, may be briefly stated as follows: A wave of increased solar radiations favorably affects the meteorology of the tropical regions, so as to produce a succession of good crops in India, China and other tropical or semi-tropical countries. After several years of prosperity, the six or eight hundred millions of inhabitants of those countries buy manufactures in unusual quantities; a good trade leads manufacturers to push their existing means of production to the utmost, and then to begin building new mills and factories. While a mania of active industry is thus set going in Western Europe, the solar radiation is slowly waning, so that, just about the time when manufacturers are prepared to turn out a greatly increased supply of goods, famines in India and China sud denly cut off the demand. "This," says Prof. Jevons, "is, I believe, the simple explanation of the overproduction so much complained of at present. Our practical men, despising all theory, and leaving the main factor in affairs (the sun) out of their calculations, just manage to make demand and supply not meet. Their arrangements are made about five years too late: just when they are in the depths of despondency, they ought to be actively preparing for the coming favorable change in the Indian trade, and when they are all hopeful and excited, the real opportunity has already slipped by. Although the examination of a great series of statistical and physical facts leads to the conclusion that the trade with tropical countries is the principal disturbing cause, a European mania is almost always complicated by variations in home industry, due to speculative sym

The unfortunate part of this hypothesis is that it places the prime cause of the fluctuations in the world's trade beyond the domain of economic science, and makes it an astro nomical problem. If the productiveness of tropical countries is affected by the causes noted by Prof. Jevons, and to the extent he assumes to be the case, an increase or decrease in the solar radiation may be an important link in the chain of causes which gives us an alternation of prosperity and depression. The periodicity of what are known as crises, established by the panics of 1827, 1837, 1847 and 1857, is generally regarded as merely a coincidence, since the predictions of a panic in 1867 were not justified by the happenings of that and mmediately succeeding years.

While Prof. Jevons is speculating upon

pathy.

the terrestrial effects of celestial phenomena, Prof. Thorold Rogers, of Oxford, contributes to one of our American reviews a thoughtful treatise on the causes of commercial depression. The first of these he believes to be the decrease in the production of gold and the consequent fall in prices. This cause, says Prof. Rogers, has been aided by a dangerous and excessive use of credits in insidious forms, evading control and relaxing the sense of caution and responsibility. Prof. Rogers also gives especial prominence to the great wars since 1861. These all resulted in the over-stimulation of certain branches of industry, with extravagance and recklessness, and led to sudden and severe reaction. The effects of the recent war between Russia and Turkey are so evident in England at the present time, and Germany and the United States are still suffering so heavily from their recent wars, can question the value of Prof. Rogers' argument on this point. Another and important cause he finds to be the malign influence of commercial dishonesty. "From tions. the effects which flow from human passions and human vices, from ambition and greed, from the criminal acts which do mischief to all, though they are only directed against individual races or indi vidual persons, there is no escape, unless men sternly and steadily discountenance that which is as debasing as it is ruinous, and which, as nations become more united by the strong but subtle bond of reciprocal benefits, have a wider and therefore a more noxious sway.'

Probably few problems have been more causes of commercial crises. The fact remains, however, that they generally follow periods of great commercial activity, and that when they come they always find the business community unprepared for them. The only lesson which the merchant or manufacturer can draw from them is to keep his business well in hand, and to manage it from year to year so that no contingency shall arise which he is wholly unprepared to meet. A correspondent of The Iron Age, writing in 1870 from one of the iron districts which suffered most heavily they are bought by mechanics in the stores and afterward fitted for use by putting "iron works in this district is now enlarging, is just about to enlarge, or has lately completed an important enlargement." In many instances these enlargements were their ability to carry large investments

or saddled the companies with heavy debts under which they have since been crushed. In this they followed the course described by Prof. Jevons, of tardy preparations to take advantage of a demand which was about to experience a heavy shrinkage. Now, we are well aware that ex post facto wisdom counts for little; but it is a safe rule in business that unexpected things are always happening, and in time of prosperity it is the part of wisdom to make provision for the contingencies of an uncertain future. It may be assumed that the fact of great and general prosperity shows that the causes are at work which will bring about a reaction more or less sharp and severe, and that a business policy to be in the largest degree successful, should be so shaped as to produce the best results five years hence. In a word, the merchant or manufacturer must be cautious, provident and far-sighted. He should remember that in the average of years one business is as good as another, and that it is never safe to carry too much sail, even with smooth water and favoring winds.

### The Substitution of Steel for Iron.

Until within a comparatively short tim the limits of the use of iron and steel seemed to be well defined. Each apparently had its own sphere, into which the other did not intrude. Iron was used for all sorts of manufacturing purposes where strength only was required, while steel, then made in comparatively small masses, was used only where such a material was absolutely necessary-in tools, springs, &c., and in small articles which had to possess usual strength. Steel was then made by the slow process of cementation, or the more elaborate method of casting in crucibles. Cast steel manufacturers contented themselves with the demands made on them by tool and implement makers, and iron manufacturers believed themselves secure in the domain which had belonged to them from the earliest times.

If there was then any presentiment of a great change about to take place in the iron trade, it was simply a belief that the days of wood were numbered, and that iron would be used for most purposes to which wood was applied. As iron bridges multiplied, and iron ships became numerous, and iron buildings increased, the manufacturers of iron became more strongly impressed with the conviction that that metal was destined to indefinitely extend its conquests over every other sort of constructive material. An iron manufacturer in those days -and they are only a few years distantwas looked upon as one who held the scepter of undisputed sovereignty in the industrial world. The manufacturers of steel went on quietly attending to the business which seemed to belong to them legitimately, and the very much higher price of their product appeared to be a bar against its general employment in construction &c. Within a few years the situation has changed. A writer in the London Times of January 3, who seems to be specially well informed on the subject, says that in 1878 the United Kingdom made not less than 850,000 gross tons of Bessemer steel and 150,000 tons of Siemens steel; making a total of 1,000,000 tons of these steels. Some of this immense product has supplanted crucible steel, but only to a limited extent, the great bulk of it entering into the manufacture of articles formerly made of iron. Boiler plates, ship plates, railroad bars, bridge shapes, merchant bars, and beams and girders are all made of this new material, so good and yet so cheap, so much more durable than iron, and only costing as much or very little more. The effects upon the iron rolling mills are easily summed up. In Wales the manufacture of iron rails is only one-tenth that no one of what it was in 1870. In the North of England the iron rail trade is almost extinct. Everywhere iron works are standing idle,

In the United States, although the same element is at work, the victory over the iron rolling mills seems to be more distant. It is estimated by the American Iron and Steel Association, that in 1878 we made about 650,000 gross tons of Bessemer steel and about 50,000 tons of open-hearth steel, or about 700,000 tons of both. A very large part of this product, however, went into rails, estimated at 550,000 tons. If it were not for this, the iron rail mills of the country would have an abundance of work; but as it is there are many mills that are doliscussed, or with greater ability, than the ing very little, and a number of them have been permanently closed. Still, so peculiar are the requirements of this country, that in 1878 as many iron rails were rolled as in 1877, and for years to come, if we are permitted to regulate our own trade affairs without foreign interference, we may expect a continued, though restricted, demand for

In other branches of the iron business the competition between steel and iron must continue to increase, and it may increase very rapidly. So many open-hearth furnaces are being built in connection with existing ironworks, that when they all get into operation they will far exceed the requirements of the so-called legitimate trade for steel, and they must make serious inroads on the business of the iron rolling mills. Even now screws justified by the capital of the companies and and wire are largely made of Bessemer and open-hearth steel. Bridge work, boiler we are unable to define with the short of depression. In many plates and stamping sheets are made to ply and demand in the English coal trade, it built strong and nog tight. For blove, a bad translation.

The short of the shor

uses are more likely to increase than diminish.

Apart from the Bessemer and open-hearth steel converting works, there are about a dozen establishments in the United States which manipulate Bessemer and open-hearth steel. Some of these works procure their supplies of steel from the converting works, while others purchase old steel rails and work them up into merchantable products. A market is thus opening for crop ends and worn-out steel rails which promises inde-finite enlargement, and satisfactorily solves the problem which vexed the minds of many in the trade several years ago-the economi

cal disposition of these waste steel products In the prosecution of a struggle as grave as that between steel and iron, the manufac turers of iron have enough to contend with in the encroachments of domestic steel manufacturers, without bearing additional pres sure from abroad. Yet there are consider able quantities of Bessemer and open-hearth steel imported at very low rates of duty, which importations, of course, only need to be increased gradually as they are increasing, until a time will come when their com-petition will be severely felt. These importations take the shape of steel rail ends, old steel rails, steel nail rods for horse nails, steel wire rods, &c. Measures should be taken to guard our manufacturers of both iron and steel from these inroads. The change to steel is taking place with sufficient rapidity, under domestic influences, to promise a serious curtailment of the business of iron rolling mills at no distant date, but if cheap foreign steel is to burden the market, great injury can be done at once.

## The Development of the English

Coal Trade. The history of the English coal trade during the past five years has been peculiar, brings into strong light points of general interest, a short summary of its development will prove valuable. It has of late been the experience of many branches of industry to be brought face to face with the stern ultimatum of "shutting down" or working without profit, or even at a loss. The questions involved in shaping a policy of such momentous importance to the welfare of an establishment are so numerous and perplexing, that we cannot wonder at the inclination often shown to shirk the issue. In the case of collieries, however, there is generally one circumstance which tends to strengthen the reluctance to surrender and place the establishment on the list of non-producers; it is the fact that abandonment means enormous cost in reopening, and that suspension involves continuous expenditure for pumping, timbering, &c. This causes the process of "weeding out" to be a comparatively slow one; while, on the other hand, the possibility of considerably decreasing cost of production by distributing the fixed charges upon a largely increased output, makes every coal owner direct his efforts toward an increase of yield, often even drawing upon reserve and stopping dead work. These circum stances account for the anomaly of a growing production in the face of a falling market, especially in districts where work is done below drainage level. England, in 1873, was at the culmination of period of unparalleled prosperity, and durng that year the coal production increased 3,500,000 tons. In 1874, when trade was egaining its normal condition, the output showed a decrease, compared with 1873, of nearly 2,000,000 tons, but notwithstanding the fact that in the following year, 1875, depression was felt in all industrial pursuits there was an increase in coal production of 5,000,000 tons, of which 10 per cent. only was absorbed by an increased export. In 1876 trade grew worse, prices declined, and still the production went on increasing at the rate of 1,600,000 tons, which in that year, however, found an outlet in an increased sale in foreign markets, amounting to very nearly as much as the surplus produced. When it became apparent that trade in the year 1877 was only to continue the disastrous course of the preceding period, a diminution of the supply was confidently looked for, but to the surprise of all, the returns proved that the output had actually been greater in that year by 1,200,000 tons than in 1876, although the sales to foreign markets had suffered a shrinkage of 1,000,000 tons. following figures will show that this continued increase was accompanied by a de crease of the number of mines and the number of miners employed, and by a continued

fall in price : Value. Mines Miners. Year. Output. Export. Year. Output. Export. Value Mines Miner 1872. 123,492,000 123,339,000 47,631,000 3627 477,001 1874. 124,938,000 13,927,000 45,849,000 1876. 133,470,000 16,209,000 46,670,000 1876. 134,610,000 15,483,000 4224 494,00 1878.

We see from this that while the production increased the average output of each mine increased, or rather that a number of smaller collieries were driven to the wall, while the larger and stronger remained on the active list. The number of miners, it will be observed, was considerably lessened by the bad times, and still the total fruit of their labor was greater, showing that each miner worked more hours, as it is not propable that the average dexterity or industry displayed by the miners was any greater. In

period under review one of its greatest con suming industries has experienced moment-ous changes. The iron trade of England in 1872 was variously estimated to consume from 30 to 34 per cent, of the entire output, Since then iron has been largely replaced by steel, in the manufacture of which only from one-third to one-quarter of the fuel is conumed. To what extent the demand for coal is lessened by this cause cannot be accurately ascertaind, but we feel confident that 7,000,000 to 8,000,000 of tons will be an inside figure.

### Waning Power of Labor Unions. We seem to be nearing the beginning of a

most important change in the relations of skilled labor East and West. It is a wellknown fact that in certain departments of skilled labor, especially in iron and glass works, wages in the West have for years been higher than in the East. This differ ence has not only been maintained, but the percentage has been constantly increasing against the West. For example, some three years ago the majority of New England were paying \$3.50 for boiling, the Philadelphia mills \$4 to \$4.50, while Pitts. burgh was paying \$5. Pittsburgh still pays this price, while boiling in New England is from \$2.50 to \$3, and at Philadelphia \$3.60. It is a fact that is recognized by both manu facturers and workingmen, that the wages battle-ground in certain industries is Pitts. burgh. Not that wages troubles in these industries do not occur at other points, but any letting down in wages at Pittsburgh means a reduction at other points as well, The Pittsburgh workmen have, as a rule, been willing to fight these battles, as they have generally won; the trouble has soon been settled, or the workmen at other points have aided them in the struggle, and expressed a willingness to go still further when occasion required. The Pittsburgh workmen are commencing to doubt the good faith of the workmen at these other points, and are beginning to ask why they should continue to fight others' battles if they are not supported by demands for the same rate that Pittsburgh pays. They are beginning to realize the truth of what they have been told, that their course was driving manufacturing establishments from Pittsburgh. This has been strikingly apparent in the case of two Pittsburgh industries within a few months. The chimney glass blowers of Pittsburgh have been on a strike for 22 months, and up to last week there was no prospect of a settlement, when the Lamp Chimney Blowers of the United States and Canada held a meeting at Pittsburgh, which, it is asserted, had been called by the Pittsburgh blowers for the purpose of establishing a uniform scale of prices This the blowers outside of Pittsburgh refused to grant, and virtually laughed at those who had been fighting their battles for two years. The convention adjourned, and the next day two of the most prominent of the strikers gave up the fight. And now the chimney blowers' strike may be regarded as virtually at an end. This is a result that must follow in other trades and branches. There is no reason in the nature of things why boiling should be from 331/3 to 100 per cent. more in Pittsburgh than in Eastern mills. The work is no harder, if as hard. and the price received for iron at the West

### Mr. Benner Rises to Explain.

Most of our readers have seen or heard about a little book popularly known as Benner's Prophecies.' Those familiar with it will remember that, while the predictions respecting 1876 and 1877 were correct, those respecting 1878 failed. Benner's attention having been called to the fact that his prophecy of an advance in the price of pig iron in 1878 over the average of 1877 was not vindicated by the happenings of that year, he sends in reply following cheerful letter, which is full of prediction for t ture :

DUNDAS, OHIO, Jan. 21, 1879.
DEAR SIR.—I have yours of the 17th at hand

You raise the question, What is my opinion of the non-fulfillment of the prophecies for 18/8? On page 114, the book says: "Congress madea mistake in not fixing Jan. 18t, 18/8, as the time for the resumption of specie payments. This delay will cause the government and people to lose 12 months of recuperative strength in the great com-mercial and financial battle of 1891." Here is where the trouble was. The great scareerow, resumption, cast its blighting shadow before it, which continued to cause the decline in prices for hogs and iron, after the winter of 1877–78.

continued to cause the the decline in prices to hogs and iron, after the winter of 1877–78.

We have now passed the River Jordan—on the up grade. Business is now reviving; confidence is being restored; prices have commenced jumping up. [See pork at Chicago for this year.] Fig iron will show us something of an advance by the middle of the summer. Prices now for hogs and pig iron will advance rapidly to make up for the year 1878, and the high points which I make in my book will all come around right—hogs at high price in 1881. The banks and people have plenty of good money—something we were short of in former hard times; for instance, 1840, 1861, &c. It is my opinion that speculation will commence now and carry things along lively. Yours,

Samuel Bennes.

If Mother Shipton is right in her historic prediction, that "the world to an end will "come in 1881," we shall not be here to fight the "great commercial and financial" battle of 1891;" but of the two, we think it probable that Mr. Benner is the neares

A Western journal describes a new form considering the curious relation between supply and demand in the English coal trade, it bull strong and hog tight." For brevity and

d in

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On another page we print an interesting article on the Pacific railroads and California freights, which gives some information additional to that contained in our editorial remarks last week. Whether the railroad managers can sustain themselves in the position they have taken, is just now a question of great interest to all who are connected with the Pacific coast trade. The first vessels to sail by the Cape Horn route since the policy of the railroad managers was fully developed, are only just beginning to arrive in San Francisco, and this reason it is too soon to know hew those who receive goods by wawill handle them in opposition to the combination between the railroad and the merchants. While the great power of the railroad is fully acknowledged, there are many who do not hesitate to say that it is by no means able to carry out its plan. A great deal of experience, ability, cunning and capital will be brought to bear for the overthrow of the monopoly. A single illustration will show how strong is the pecuniary motive which will influence the opposi-A large quantity of nails, lately shipped from this port, are about to arrive in San Francisco. These, owing to the cheaper transportation by water, can be profitably marketed 10 per cent. below the cost of nails delivered in San Francisco by rail. As the large jobbers are prohibited from touching these nails by the terms of their contracts with the railroad, some one not in the ring will undertake their distribution to the retailers and large consumers, and if the shipment is even fairly profitable, others will follow in quick succession. The result will be that the houses which are manacled by the railroad, will find that their customers are being supplied by others. Their combined influence to hold their trade will be powerless against a 10 per cent., or even a 5 per

cent. margin on anything which sells as

close as nails. We see no reason why the

same thing should not happen in all lines of

heavy goods, if their season is anticipated

by early shipment round the Horn. This

would make important changes in the

trade of the Pacific coast, and the margins

are certainly large enough to encourage a

great many to go into the importing busi-

ness who have hitherto refrained from en-

gaging in it.

The promises with which 1878 opened, re garding immigration of the unemployed from the overcrowded cities and manufacturing districts of the older States to the agricultural districts of the West and South-West, have been verified. There were only 147,000 immigrants in 1877, of whom not more than So,000 settled. Last year, however, they numbered over 600,000, nearly all of whom were from the Atlantic States. Of these it is claimed that 200,000 settled in Texas, 125,000 in Kansas and 100,000 each in Nebraska and Dakota. These people have taken up at least 14,000,000 acres of land. The indications are that the inland immigration will not be so great this year as last, but the foreign immigration will be much greater. For the 12 months ending Jan. 31, 1879, the number of immigrants arriving at the port of New York was 82,125, as against 66,170 for the same period ending Jan 31, 1878. The great depression in other countries will stimulate immigration, and it will be found that it will include a larger proportion of skilled workmen than for some years previous.

The Pittsburgh Chamber of Commerce has published, in pamphlet form, the address of Mr. Joseph D. Weeks on arbitration. which appeared in our last issue. Ten thousand copies have been printed, and will be circulated among the manufacturers and workingmen in that district.

### New Publications.

Manual for Engineers and Steam Users. By John W. Hill, M. E. Published by William A. Harris. Price to cents.

This little manual, published by the manufacturers of the Harris-Corliss engine, is in its aim similar to many of the "pocket-books" issued by bridge builders and others. It contains quite a mass of useful information, compiled from a variety of sources. It is intended chiefly to serve as a guide to It is intended chiefly to serve as a guide to the users of steam engines.

THE STRENGTH OF MATERIALS. By William Kent, M. E. Van Nostrand's Science Series, No. 41. Price 50 cents.

A great element of success in all manufacturing industries is a close study of the demands of consumers, which should not be limited to their prompt discovery, but must extend to a thorough appreciation of the reasons which call for them, and the ends which the improved product is to meet. We

eminently satisfactory, and cannot fail to commend itself to the agricultural mind.

New Movements in the California Trade.

On another page we print an interesting fingers' ends. The importance of mechanical tests are matters which every manufacturer or engineer should have at his fingers' ends. The importance of mechanical tests is represented by the profession of the control angers' ends. The importance of mechanical tests is generally conceded, but, unfortunately, the conceptions of their present and prospective value are often crude and erroneous. The information on the subject is either laid down in elaborate professional works, or in single papers read before engineering societies, which makes them inaccessible. In the little work before us, Mr. William Kent a scholar and for some time William Kent, a scholar and for some time an assistant of Prof. Thurston, who is an authority of international fame on the subject, has summarized the present achievements of experimenters, and pointed out in an able manner the large field which is still open for research. The author urges the necessity of adopting some stan-dard shape of short specimens for the determination of tensile strength. He points out how conflicting and incomplete is the whole matter of compressive strength, and proposes as a standard size for a com-pressive test, a cylinder one inch in length and one-half square incl. in section, and for the limit of compression equivalent to fracture 10 per cent. of the original length. In the examination of shearing stresses, a complex subject, much work remains to be done; while, on the other hand, in torsional experiments, Prof. Thurston has achieved his remarkable successes. Mr. Kent seems to have devoted much attention to a study of the resistance of materials to continued and to repeated stresses, to sudden shocks and to vibrations. He forcibly points out the necessity of settling what relation exists be-tween tensile, compressive or torsional strength and ductility on the one hand, and resistance to repeated shock on the other. He appeals repeatedly to the government as the proper party to extend some aid for settling this and many other important questions, which we think are so urgent that they should not be left to await the tardy recognition of Congress. The matters so directly affect large interests, both of producers and consumers, that it would seem to be their province to take energetic action in this matter. Mr. Kent has done a good service to manufacturers, to whom we recommend his work as an intelligent, brief and clear statement of the present status of the question.

### Metallurgical Notes.

THE ELLERSHAUSEN PROCESS AND THE OPEN HEARTH STEEL MANUFACTURE.

It may be of interest to some of our saders who remember the once famous readers who remember the once famous Ellershausen process with regret, to learn that it has not ceased to occupy the minds of metallurgists on the other side of the Atlantic. In a modified form it has retained Atlantic. In a modified form it has retained an advocate in Prof. Ackerman, who, in a recent paper, states it as his opinion, that for those works which do not possess a sufficient supply of good iron or steel scrap, but which are in close proximity to a blast furnace and can procure rich and pure ores, the Ellershausen process offers a cheap means for obtaining on a large scale a material suitable. obtaining on a large scale a material suitable for the open-hearth process. He contends that while there was no reasonable hope for making a uniform, solid product by heating the mixture of pig and ore made by Ellers hausen process to a welding temperature, there is no doubt that the iron in the ore is more thoroughly utilized, and the walls of the open-hearth furnace are less exposed to wear, if the pig and ore is first mixed out-side of the furnace. He thinks that the main element of success will be fulfilled if the flow of iron and powdered ore is so regulated, that the quantities filled into each mold of the rotating table is so small that the mixture is chilled before it ceases to be the mixture is chilled before it ceases to be thorough. According to this it would seem as though Ellershausen has had the misfortune, like many inventors, of being in advance of his time; although in other respects he has hardly had the proverbial misfortune of inventors.

ESTIMATION OF COPPER IN STEEL

As much importance is deservedly As much importance is deservedly attached by many metallurgists, especially in Austria, Germany and Sweden, to the determination of the amount of copper in steels submitted to analysis, we would cite the following method for its determination, as given by Mr. Andrew A. Blair, formerly chemist to the United States Test Board, and now a member of the well-known Philadelphia firm of chemists. Measure Booth firm of chemists. Garrett & Blair. It is a modification of Luckow's electrolytic test, first practiced for copper ore at Mansfeld, Germany: Weigh out 5 grams of borings into a beaker of about 750 c. c. capacity, and dissolve in a mixture of 30 c. c. of hydrochloric and 15 c. c. of nitric acid. When the solution is complete, boil for some minutes, dilute and filter through a ribbed filter, wash well, heat the filtrate almost to boiling, add 10 c. c. of sulphate of ammonia, nearly neu-tralize with ammonia and boil until colorless. Add 5 c. c. of hydrochloric acid, and pass sulphuretted hydrogen through the boiling solution until the precipitate of sulphur, &c., agglomerates. Filter on a ribbed filter, wash with boiling water and dry the filter and precipitate. Ignite carefully in a porcelain crucible, and when the filter is perfectly burned, allow it to cool and digest at a gentle heat in nitric acid with a few drops of sulphuric acid, covering the cruci-ble with a watch glass. When the sulphide of copper is perfectly decomposed, remove the watch glass and evaporate off the nitric on the water large for product is to meet. We the water large for produces to rival their customers in the knowledge of their own business, but would knowledge of their own business, but would be good their own business, but would have a fight to expect, from the general drift which improvement is taken in a ring suspended from a stand, being held by a screw, which is also arranged for receiving the conducting wire of a battery. The second wire from the battery is attached to a similar screw, which considered and their engineers requirements are met. Many of the so-called "tests" made to determine the water and their engineering constructions are unreliable, they are generally not sufficiently exhaustive, and in many loss sufficiently exhaustive, and in many loss sufficiently exhaustive, and in many loss of the case, plus and to the least they is added, as the amount shipped directly from the mines to the gold and silver mills, it will be seen that 63,484 flasks covers the entire freight movement is taken the mines to the gold and silver mills, it will be seen that 63,484 flasks covers the entire freight movement between the Attentive production for 1878. The exports from San the mines to the gold and silver mills, it will be seen that 63,484 flasks covers the entire freight movement between the Attentive production for 1878. The exports from San the mines to five and to execution, by which it was sought to expect, from the acid until fumes of sulphuric acid appear; life to these figures 1003 flasks are cool, dilute a little, and wash out carefully into a mail platinum crucible, which is able and an acid until fumes of sulphuric acid appear; life when the subject and to aid in the screential scheme was first announced and carried into execution, by which it was last August that scheme was first announced the scheme of any share in the production for 1878. The exports from San the mines to the gold and silver mills, it will be seen that 63,484 flasks covers the entire freight movement between the Attentive from

The following items, the first from the Harrisburg Item and the second from the Scranton Republican, show that the rivalry between the mills of that section of the country continues. On Wednesday night the rail mill made 662 rails, working from 6 o'clock p. m. until 5.30 a. m. This is the o'clock p. m. until 5.30 a. m. This is the largest run ever made at these or any other works in the country in the same period of time. The rails were 30 feet long and weighed 50 pounds to the yard and run through 13 passes, which is two more than the usual number of passes. The Scranton Steel Mill nade, Jan. 9, 800 bars in 11 hours 15 minutes; Jan. 10, 800 bars 11 hours minutes; Jan. 11, 800 bars 11 hours minutes. And for the week ending Jan. 18, rolled 4784 bars in 6 turns of less than 12 hours each, an average of 7971/3 bars per turn, done also on 15 passes, and not on 13 passes as at Harrisburg.

EARLY PATENTS FOR THE OPEN HEARTH

STEEL PROCESS. As an instance of the manner in which great industrial conquests are foreshadowed by the struggles of pioneers, whose heroic flights for recognition deserve sympathy, we would cite some early English patents in which many points essential to the successful working of the open-hearth steel process were recognized. The earliest attempt made in England before 1802 were alluded to in a recent issue of *The Iron Age*. The record of a later effort we find in the English Patent Office, by Josiah Marshall Heath, who seems to have wasted his energies and his substance upon his schemes, perishing in India in the government service. His first patent specification, No. 8021, dated October 5, 1839, is a curious document. He describes and claims the manufacture of a pure cast iron in a blast furnace, without the use of any vitreous flux, slag or cinder, from pure native oxides and carbonates. pure product he converts into steel of any required degree of hardness by melting it in required degree of naraness by melting it in a cupola, adding iron scrap and sesquioxide of manganese, taking care not to use much fuel in order not to "deoxidize the manganese, nullify its decarburating action upon the cast iron, and thus prevent it from reducing the metal to that lower stage of carburet which constitutes cast steel." He proposed to complete the decarburation to the required degree by subsequent concentration. In another part he claims the employment of carburet of manganese in preparing an im-proved cast steel. In a subsequent patent, No. 10,798, dated February 4, 1845, Heath states that he had found that "the decarburation of the pig might be more conveni-ently and perfectly accomplished by per-forming the process of decarburation in an apparatus distinct from that in which the apparatus distinct from that in which the pig iron is melted." He urges that the fluid pig iron should be run into a receptacle made of any material capable of withstand-ing an intense heat, similar in form to a common refinery or to the shallow well of a reverberatory furnace, the interior of which should be kept at the highest temperature that can be produced. He states a convenient method of producing this high temperature to be by means of currents of igperature to be by means of currents of ig-nited carbonic acid gas, conveyed through pipes placed round the top of the receptacle, slightly inclined downward so as to bear upon the surface of the fluid metal. In order to burn the carbonic oxide, he declares it to be necessary to introduce along with it a current of hot atmospheric air, but he does not claim any method of producing the high temperature required. For decarburating the fluid iron he mixes it with a cer tain portion of malleable iron, the quantity depending upon the hardness of the product required and the quality of the pig. He mentions also that malleable iron produced directly from the ore, and heated to redness in a preheating chamber attached to his furnace, would be a very convenient form. It is striking that in this specification former claims for the use of oxides of manganese or of carburet of manganese were entirely

QUICKSILVER PRODUCTION OF CALIFORNIA IN

1878.

1	fornia to San Francisco:	
1	Mines.	Tasks
П	New Almaden	15,24
	New Idra	5,13
	Guadalupe	
1	Sunderland	
٠	Abbott	
. ]	St. Johns	
	California	
1	Napa Con	
9	Great Western	
	Oceanic	
ı	Sulphur Bank	
	Redington	
1	Oakland	
Н	Altoona	
1	Phoenix	53
	Cloverdale	
1	Mines	50

This, as compared with the production of 1877 and 1876, shows a falling off of 16,124 flasks, and of 12,598 for these years respec-

for copper. Then it is dried at about ICO° IC. for a few minutes, left to cool and weighed. If the precipitate is dark colored, it may be dissolved in a few drops of dilute nitric acid and the copper precipitate as before, when it will always be perfectly bright and metallise in appearance. Dissolve out the copper with a little nitric acid, wash out the crucible with water and alcohol, dry and weigh. The difference will be the copper. The extreme delicacy and accuracy of this method are beyond all praise; o.r milligram can be detected and estimated.

RIVAL MILLS.

The following items, the first from the Harrisburg Item and the second from the ITEM INTO THE NORTH MODEL OF FOREIGN ORES INTO THE NORTH wrought or malleable iron, and to harden only portions of the article in different degrees, if required, Mr. Gracie S. Roberts, of Brooklyn, makes use of an improved method.

After polishing the surface, he glues to the portions to be case hardened accepting of

IMPORT OF FOREIGN ORES INTO THE NORTH OF ENGLAND

So much has been written of late of the so much has been written of late of the increasing dependence of the English iron and steel industry upon supplies of ores from foreign countries, notably Spain, that it will be of interest to state the following figures for 1878: The amounts imported into the Tees, Tyne and Wear respectively, were 177,928, 149,004 and 51,940 tons—almost the whole coming from Spain. Bilbao figures prominently with 131,072, 115,263 and 48,952 tons, while Elba contributes about 14,000 tons in all.

### Coercion by Railroad Monopolists.

The combination of the Pacific Railroad ompanies to compel merchants to ship by their lines rather than by the water routes, is odious in a twofold sense. The manifest injustice of such an attempt, as affecting mercantile interests, is bad enough, but the attitude of hostility thus assumed against our ocean commerce aggravates the offense. A railroad born of the nation's generosity no sooner feels its strength than it proclaim war against our mercantile marine, and this, too, at a most critical period, when various influences conspire to drive our flag from the ocean. But all patriotic sentiment aside, where, as at present, the immediate issue by the present, the immediate issue presented is a question of self-preservation, let us see the practical working of the antagonism of the Pacific railroads and our shipping employed in the California trade.

If the railroad agents find that goods are being shipped are Care.

eing shipped ria Cape Horn, then com-nences a reckless cutting of rates, transportation by rail being offered for almost nothing rather than lose the business. Within a week an offer was made to take common bar iron to San Francisco at \$13 per ton, or, as remarked by the agent when leaving, "perhaps \$12," while for railroad iron the rate was \$30 per ton. Why this difference in transporting articles of the same class, equally difficult to handle? It is suggested that in the one case there may be introduced by the same class. interference with some pet speculation—that shipments might tend to bear the mar-

Rates by sail are very low, say for nails actes by sail are very low, say for nails 30 cents a keg; other hardware \$6 to \$8, or about one-half of former rates, when whole cargoes were taken at \$12 to \$13 per ton. Railroad rates for the same articles at present are probably \$40 to \$50 per ton. Obviously the clippers would secure the bulk of the heavy freights if competition were left free; but the contracts which mer-chants and shippers in the California trade are compelled to sign, as noted in our editorial remarks last week, prevents. torial remarks last week, prevents, them buying, receiving or handling any morchan-dise carried by water. If the monopoly thus created can be sustained long enough, the clippers will be driven from the California trade. Indeed, the railroad magnates already predict that a year hence there will be no more clippers left in the trade. According to the calculation of one of our largest shippers, who is sending out on an average two cargoes a month, there are dispatched from New York to San Francisco about 60 ships a year; and it is thought probable that, should the railroad interest continue as hostile as at present, this number, within the next twelve months, may be reduced one-half. But there is no fear of the im-mediate extinction of this class of vessels. Grain-growing is a great industry on the Pacific coast, and so long as the wheat crop is produced so long will ships go there for it. To make a paying voyage, a ship must have a certain amount of earnings, from some source or other, on the round trip. If her freightage outward from New York is reduced one-half, it must be increased proportionately in the cost of grain transporta-tion. The loss comes on the farmer, as he must sell his produce just so much cheaper to meet the foreign market. Thus the rail-roads, while enriching themselves by a grasping policy, as unjust as it is short-sighted, do so at the expense of the agricul-tural interest of the Pacific States.

It will also change the whole character of trade. Take the experience of a dry goods man, who agrees to send by rail at from man, who agrees to send by rail at from \$60 to \$100 per ton. Another merchant ships similar goods by sea at \$10 a ton, or half a cent a pound. As a result trade is demoralized, for no uniform price can govern the market where it is disturbed by such abnormal movements. It is evident such abnormal movements. It is evident that to accomplish their object, to succeed in their rivalry with sails, the railroad people must bring within their control every merchant from California to Oregon. Having gained this end, bundreds of smart men in the East discover that by shipping around the Horn in advance of the season, they can undersell through agents to the retail trade. The consequence is that shippers by rail will find their business gradually leaving them, and a new set of merchants in the market who come in to compete. While on the subject and to aid in a

After polishing the surface, he glues to the portions to be case hardened a coating of yellow prussiate of potash. A number of coats are given, according to the degree of the case hardening required. A cheaper material or simply boneblack is used where a slight effect only is required. When the glue is set hard, the article is packed in powdered charcoal, heated to redness in a quick fire and maintained at that heat for half an hour. Then it is hardened and tempered in the usual manner. chants could be kept in submission chants could be kept in submission. The monopolists, moreover, reserved the right to terminate the arrangement at pleasure. From the foregoing it will be seen that the situation in which large classes of business

men find themselves is quite extraordinary.
In the first place, almost the entire body of
merchants on the Pacific Coast, under specious representations or ominous threats, have been induced to sign a contract degrading in its terms, because requiring a render of private rights. As the rule, merchants jumped at the enticing bait, for a low rate of freight—a reduction of one-half from former charges—was in itself very desirable. Besides, there was little time pe mitted for deliberation; there must prompt decision one way or the other, so that in a number of instances the Eastern partner of a house knew nothing of the contract until it was signed, sealed and delivered Those who kept aloof were soon made to feel very uncomfortable. Still another class, comprising not a few who unwittingly com-mitted themselves, now unhesitatingly de-nounce the whole movement, but sub rosa, for the reilroad folks might hear of it Others, though not prepared either to de nounce or defend the measure, simply ac-quiesce becaues "there's money in it." In-deed, they admit that it is wrong in principle, but the railroad men were she enough to see their opportunity and upon it : it was only human nature to do so. Moreover they are sorry for the "clipper" folks, who find themselves in a tight place, with their business fast ebbing away. They are sorry for neighbors in the trade who are not in the pool and find it impossible to comnot in the pool and find it impossible to com-pete, but really they don't see how the mat-ter can be helped. Finally, as regards the merchants at large, with the exception of those identified with sailing ships, it is ac-knowledged that they are gagged and ound : under no circumstances onsent to be so much as named as he the railroads or parties to any controversy. Plainly speaking, they are not prepared to bring down on themselves the displeasure of a great corporation, which has power to harass beyond endurance, and even to de-

stroy.

Thus, in surveying the field, it appears that there are only about five large shippers of freight in the entire trade with San Franof freight in the entire trade with San Francisco who are making anything like a vigorous fight, and among these, as might be expected, the feeling of indignation and excitement is intense. Behind these are a large number of the rank and file, who brood over their grievances in secret, too timid to venture from their cover. No one seems able to suggest a practicable remedy for the existing evils, hence the appeal to Congress to break the power of the Pacific railroads,

by legislation looking to the regulation of interstate commerce.

One point to be observed in explanation of the tactics now resorted to, is that the railroad company, having subsidized the Pacific Mail steamers, giving them a certain amount in money whether they have earned it or not, all that can be squeezed out in freight money lessens the peactly to that extent. lessens the pecuniary obligation

During the past week we have received the following communication, relative to the effort of the Pacific Railroad management to

destroy the shipping interest:

To the Editor of The Iron Age.—Dear Sir:
Much dissatisfaction with the Pacific railroads is manifested in some quarters among freight contractors who are bound to the railroads, and who find the clipper the railroads, and who find the clipper freights reduced and their competitors shipping goods which must inevitably come in competition with their own, shipped by rail at greatly higher rates. The extinction of the clipper-ship competition around Cape Horn, aimed at by the railroad managers, was thought, no doubt, to be a brilliant conception, but the execution of this plan may prove to be no exercise. this plan may prove to be no easy task. Ships are now leaving Atlantic ports at the rate of one a week, with full assorted cargoes. Most of the shippers by these vessels speak feelingly of the manner in which rail speak feelingly of the manner in which rairroad agents have attempted to seduce them into contracts, under stipulations which they say are inconsistent with their self-respect. To be bound by a railroad or any other company as to the manner in which they say are inconsistent with their self-respect. To be bound by a railroad or any other company as to the manner in which they may be permitted to conduct their business, is something new in American citizenship. These clipper ships are the production of the best American marine ar-chitects, and are viewed with just pride by the American people. They have been paid for in honest money in the spirit of legitic the American people. They have been paid for in honest money in the spirit of legitimate enterprise, and certainly have enough to contend with without being assailed by an enemy in the guise of a friend and under government protection. They ask no subsidies or enormous grants of land from the public domain, and their obligations, of whatever kind, taxes or otherwise, are promptly met. All they ask is that the railroads that have been built and subsidized with the people's money, shall not be used to destroy them and drive them from the flag. Fair competition is all they ask, and the least they have a right to expect, from their own government; but the railroads, in

### Trade Rivalries of England and the United States.

The intimacy of the commercial union between the United States and Great Britain is curiously illustrated in many ways. For example, England finds herself moved to example, England finds herself moved to shut out Americans from competition with her own products, so far as possible, in order to rectify the balance of trade, and to prevent our continued encroachment on her foreign markets. But she cannot place restrictive duties on imported articles of food, such as grain and provisions, because that would enhance the cost of living to her own workmen, who are already restive almost beyond control. In their present temper these men are not disposed to listen to the suggestion of a reduction of wages, even to save their employers from bankruptcy. Still less would they consent to an increase in the cost of food; nor is it any more practicable to put an import duty on practicable to put an import duty on cotton, which goes so heavily against Great Britain in the balance of trade, for that means nothing less than an e nbargo on the manufacturers themselves. means a shortened production, a discharge It means a shortened production, a discharge of hands, and higher prices for the manufactured product, interfering with successful competition abroad. The industries of England are thus placed between two difficulties. Nevertheless, Birmingham, Manchester and Sheffield are not speedily to become extinct cities. British skill and capital must survive even the present severe ordeal. The indications, however, point unerringly to an era of low wages and reduced costs everywhere. British ships, too, must costs everywhere. British ships, too, must continue to earn small profits for their owners. English manufacturers are watchowners. English manufacturers are watching with solicitude, gravely studying the situation in hopes of finding relief, or at least discovering where this struggle will end. According to such high authority as Prof. Jevons, the present is one of the periodic commercial crises, as much to be expected as the stated return of a comet whose orbit is known. Touching this point the London Times says:

"Mr. Lefevre, as president of the Statistical Society, has just laid before that body an analysis of the facts of our commercial and manufacturing position now, compared with what it was during a similar time of depression ten years since. The examination thus instituted is altogether satisfaction thus instituted is always as we were tory. We are not so prosperous as we were six years since, but we are better off than we were during the bad times ten years ago. We have not slipped back so far as we had we were during the bad times ten years ago We have not slipped back so far as we had gone forward. The population of the coun-try has, of course, increased; but, accord-ing to Mr. Lefevre, wages and wealth and commerce have increased in a still greater proportion. The deposits in the savings banks are greater than they were, and the amount assessed to the income tax under Schedule D, shows an increase of 60 per cent. In spite of all the deductions that may be made from these figures, enough must remain to show that the nation as a whole is much better off now than it was in whole is much better on now than it was in 1868, which was a corresponding period of depression; and, though our progress may be for the time checked, we have not lost much ground, and may fairly look for something more than a renewal of our former prosperity when a revival does occur."

Our English contemporaries do not despair of the future, but the prospects as yet are darkly clouded. While American trade must suffer in some of its branches from sympathy, our manufacturers temporarily hold vantage ground, parallel in some respects to that occupied by England, as regards her maritime interests, during our late civil war. What she then gained on the sea we may ere long recover in the smithery and workshop. smithery and workshop.

### Labor and Wages.

A reduction of from 5 to 20 cents was made last week on the wages of special laborers in the mills of Phillips Nimick, South Side, Pittsburgh, Pa.

The Pennsylvania Railroad Company, at their shops on the East Newark Meadows, N. J., employ 800 men eight hours a day, at

20 cents an hour.

There was a general reduction of 10 per cent. in the stove foundries in Wheeling, W. Va.; Bridgeport, Ohio, and Martin's W. Va.; Bridgeport, Ohio, and Martin's Ferry, Ohio, recently.

All the railroad mines near Pittsburgh reported running at 3 cents still continue.

About forty men from the Birdsboro Iron Works left for Phænixville, where the majority of them have obtained employment.
A large manufacturing establishment in Lowell, Mass., is said to be paying its op-

eratives higher wages now, notwithstanding recent reductions, than during 1860, when the cost of living was about the same as at present. The average weekly wages of the girls were \$4.34 in 1878, against \$3.26 in 1860, the price of board being \$1.75 per week in 1878, against \$1.25 in 1860. The earnings of a girl over and above board were in 1878 \$2.59 per week, against \$2.01 in 1860. Another industrial establishment in Massachusetts is said to have paid its in Massachusetts is said to have paid its hands on an average \$217.34 per annum for eleven hours' work a day in 1860, \$318.88 for eleven hours' work in 1870 and \$256.73 for ten hours' work in 1878. Since 1870 the necessary cost of living has, of course, greatly decreased.

Two hundred and seventy-five men are the corrections of work at the control of the part of the course of the correction of work at the control of the correction of work at the correction of the

Two hundred and seventy-five men are thrown idle by the suspension of work at the XX furnace, Shawmee, Ohio.

The following brief summary gives the condition of affairs among the miners on the Panhaudle Railroad: Bell's, 75c. per ton; no checkweighman. Camp Hill, 3c.; no checkweighman. Fort Pitt, 3c. Cherry's, 3c. Oak Ridge, 3c. National, 7oc. per ton for all Western trade; 3c. for Eastern. Rend's, 7oc. per ton. Brier Hill, 6oc. per ton. Primrose, 7oc. per ton. Walnut Hill, 7oc. per ton. Midway, north side, 65c. per ton; south side, 55c. per ton. Glenn's (Candy mines), 78c. per ton. Clarke & McCabe's, 3c. per bushel and checkweighman. Bower Hill, 3c. and checkweighman. Rend's, 7oc. per ton. Nixon's, 3c.

The Schuylkill Coal Exchange issued Frience.

or ton. Nixon's, 3c.

The Schuylkill Coal Exchange issued Friday the following circular in regard to wages to be paid for January:

Pottsville, Feb. 3, 1879.—The following collieries were drawn to furnish prices of

coal sold in January, 1879; to fix rate of wages to be in January, 1879, and, the fol-lowing returns have been made:

Glendower Collery, (P. and R. C. and L. Co). \$1.70
Eagle Hill Shaft Colliery, ditto. 1.82
Wadesville Shaft Colliery, ditto. 1.63
West Shenandoah Colliery, ditto. 1.77
Mahanoy City Colliery, ditto. 1.84

The average of these prices being \$1.76 6-10; the rate of wages for January, 1879, is 24 per cent below \$2.50 basis.

Messrs. John H. McGowan & Co., of Cin-Messrs. John H. McGowan & Co., of Cincinnati, Ohio, have recently been making some extensive improvements in their establishment and greatly enlarging their business. They have just taken a large three-story building on Second street, in the rear of their present warerooms, 136 West Third street, and added it to their own by third street, and added it to their own by cutting large doors through upon each floor. This addition, which has been much needed by the firm, has more than doubled the capacity of the establishment. The firm have pacity of the establishment. The firm have recently purchased the patterns, patents, trade-marks, &c., of the McGowan Pump Company. This company had been at work several years, and had a very large collection of pumps, patterns, &c., said by many to have been the largest in the Western States. The firm will manufacture these goods and have recently issued a very hand. goods, and have recently issued a very hand-some catalogue of all the lines of goods which they make, including a great number of pumps of various sizes, both for hand and steam; cuts of valves and various other parts of pumps, steam governors and various steam attachments. In this catalogue we also notice a very full line of the new "Rival" steam pumps. The firm are making large additions to their present machinery in the way of putting up lathes, &c., doubling their shafting, pulleys, &c. In addition to their regular lines of goods, they have recently begun the manufacture of to-bacco atting a solution. bacco-cutting machines, for which they already have a fair number of orders. They laready have a fair number of orders. They have at present some 200 orders for pumps upon their books. They are now putting in a large stock of steam fittings, together with cast and wrought pipe of all sizes.

The Pittsburgh & Lake Erie Railroad The Pittsburgh & Lake Eric Railroad, Pittsburgh's new outlet, was opened for freight traffic on last Monday, the 10th. This is an ordinary gauge road, running from Pittsburgh to Youngstown, Ohio, at which place it connects with both the Lake Shore and Atlantic and Great Western railroads. This gives Pittsburgh what it has roads. This gives Pittsburgh what it has long needed, a competing road both East and West, and with the river and the roads it now has, abundant and competing transpor-

The case of various parties against Adriance & Co., for alleged infringement of the Wood mower and reaper patent, is still in the hands of the lawyers, a Master in Chan-cery being now engaged in ascertaining the amount of damages, to be graded according to the number of machines put into market.

### Special Notices.

### Hardware Business for Sale

A well-established business in a prosperous town in Michigan, good agricultural surroundings. A very desirable opportunity for man of moderate means. Stock in first-class order. Bresent inventory about \$600. The very best of reasons for selling.

For full particulars address

Office of The Iron Age, 83 Reade St., New York.

### Wanted.

Good, experienced Guide Rollers, who can roll all sizes of merchant iron by guide or hand.

Office o The Iron Age, 83 Reade St., New York.

TRADE SALE OF HARDWARE, TABLE and POCKET CUTLERY.

FRENCH TINNED AND ENAMELED WARE, &c. BISSELL & WELLES, Auctioneers.
Commencing WEDNESDAY, February 19, 1879, and continued on following days at 10½ o'clock each day, at our Salesroom, No. 83 Chambers and 65 Reade Streets, N. Y.

Streets, N. Y. WEDNESDAY'S SALE. WEDNESDAY'S SALE.

Will comprise a large assortment of Hardware, Edge Tools, Files, Brushes, 500 doublé smooth and Jack Planes, 300 doz. Halter Chains, 2000 doz. Wrought Hinges, 1 and 15/Malleable Iron Pulleys, Single and Double Wheels, 300 doz. Ax Handles, extra and No. 1 Sledge and Pick Hundles; also, a large line of French Tinned and Enameled Ware, Wooden Ware, Cedar Ware, &C. &C.

Wooden Ware, Cedar Ware, &c. &c.

Thursday & Friday, Fob. 20 & 21.

Special Sale of over 20,000 dox. American Table Cutlery. This sale will comprise the entire production of Seconds of the Six Companies, comprising the Cutlery Association of the United States, and will consist of a very large and desirable assortment.

The Cutlery Association of the United States, and will consist of a very large and desirable assortment.

The Cutlery Association of the United States, and will consist of a very large and desirable assortment.

The Cutlery Association of the United States, and will consist of a very large and desirable assortment.

The Cutlery Association of the United States, and will be the Cutlery, Silver-Piated Tea and Table Spoons and Forks, 4 oz. plate; 200 doz. Pocket Knives, American manufacture, in 2, 3 and 4 blades, bone Ivory, pearl and shell, together with other lines of goods too numerous to mention. This sale will be worthy the attention of the trade.

BISSELL & WELLES, Auctioneers,

BISSELL & WELLES, Auctioneers,

BISSELL & WELLES, Auctioneers,

BISSELL & WELLES, Auctioneers,

### TO CAPITALISTS AND OWNERS OF BAR MILLS.

The owner of valuable patents and perfected machinery for making Horse Shoes, wishes to meet some party who will join him in the said manufacture.

manuracture.

The shoes are better than any now in the market and can be produced much cheaper. This matter will bear the closest scrutiny, and an investigation of the control of the produced much can be should be a second of the produced that the closest scruting and an investigation of the produced second of the produced that the closest scruting and the second of the control of the second of the control o tigation will disclose an opportunity for business

M. D., 35 Cambridge street, Boston

### For Sale.

Valuable manufacturing property, Foundry and Machine Shop, capable of producing the heaviest work. Large yard room. A good wharf and rail-road connection by spur track. Situated at South Norwalk, Conn. Terms reasonable.

E. HILL, Trustee.

WANTED-A SITUATION BY A YOUNG man who speaks English and German, and having five years' experience in the retail Hardware business, by some wholesale or retail Hardware House. A No. 1 reference furnished.

Address

Lock Box 156,

Goshen, Ind.

### Special Notices.

### Second-Hand & New Tools FOR SALE.

February List.

The Tools in the following list are all of Wood, Light & Co.'s make, have been used, but are all in good order and will be sold very

Five Engine Lathes, 15 in, swing 6 ft. bed.
Six Engine Lathes, 20 in. swing 7½ ft. bed.
Five Engine Lathes, 20 in. swing 7½ ft. bed.
One Engine Lathe, 21 in. swing 6 ft. bed.
One Engine Lathe, 21 in. swing 16 ft. bed.
Cae Engine Lathe, 21 in. swing 16 ft. bed.
Cae Engine Lathe, 24 in. swing 12 ft. bed.
Two Upright Drills, 27 in. swing, not geared.
One Upright Drill, 22 in. swing, not geared.
One Upright Drill, 32 in. swing, not geared.
One Upright Drill, 32 in. swing, back geared as of the control of the contro

One Upright Drin, 32 in. x 4 ft.
One Planer, 24 in. x 23 in. x 4 ft.
One Planer, 24 in. x 24 in. x 4 ft.
Two Planers, 32 in. x 30 in. x 6 ft.
One Planers, 32 in. x 30 in. x 10 ft.
One Planer, 37 in. x 30 in. x 10 ft.
One Planer, 74 in. x 36 in. x 15 ft.
One Planer, 72 in. x 66 in. x 24 ft.
One Shaping Machine, 12 in. stroke.
Four Bolt Cutters, various sizes.
Two No. 2 Milling Machines.
One Horizontal Boring Lathe.

The following are all new tools to be sold very low, and are all Wood, Light & Co.'s make:

make:

Four Engine Lathes, 16 in. swing, 8 ft. bed.
Two Engine Lathes, 16 in. swing, 8 ft. bed.
One Engine Lathe, 20 in. swing, 20 ft. bed.
One Engine Lathe, 20 in. swing, 14 ft. bed.
Three Flaners, 44 in. x 24 in. x 4 ft.
Two Flaners, 45 in. x 25 in. x 12 ft.
Two Flaners, 36 in. x 36 in. x 12 ft.
Two Shaping Machines 8 in. stroke.
Three Shaping Machines, 11 in. stroke.
One Shaping Machines, 12 in. stroke.
Two No. 2 Bolt Cutters.
Seven No. 2 Bolt Cutters, with centers.
Five No. 2 Bolt Cutters, with center.
One No. 1 Milling Machine.
Also the following miscellaneous Tool

Also the following miscellaneous Tools:

Also the following miscellaneous Tools:
One Portable Engine, 6 in. cylinder.
One Hand Milling Machine.
One "Pond" Index Milling Machine.
Three Chase Patent Pipe Cutting Machines.
Two Engine Lathes, 13 in. swing, 6 ft. bed.
Two Engine Lathes, 22 in. swing, 8 ft. bed.
One Engine Lathes, 23 in. swing, 6 ft. bed. One
Engine Lathes, 15 in. swing, 7 ft. bed. Three Engine
Lathes, 20 in. swing, 8 ft. bed. Six Turning Lathes,
14 in. swing, 4½ ft. bed. Six Turning Lathes,
14 in. swing, 4½ ft. bed. Three 4-spindle Drills.
One 8 in. Shaper. One Gear Cutter. One new
"Hardaway" Bolt Heading Machine, to head up
to ½ in. bolts. One new "Hardaway" Bolt Heading Machine to head up to 1½ in. bolts. A lot of
Saw Tables and Wood Working Machinery.
Please specify which of the above tools you want
and we will forward all particulars.
The above tools will be sold very low, and can be
seen at

The Geo. Place Machinery Agency 121 Chambers and 103 Reade Sts., NEW YORK.

### Leigh's Tables of Mercantile Discounts

(5 % to 821/2 % and all the combinations.) ed in three parts:

Arranged in three parts:

I. Comparative Discounts.

II. Comparative Net Prices.

III. Computing Tables.

Parties desiring a reliable, comprehensive and practical work on compound discounts, are invited to examine the plan of this book. Specimens of the different parts will be mailed pree upon application to the author at St. Louis. The book mailed postpaid to any address for \$1. Address

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St. Louis Elevator, St. Louis, Mo. Or either of the Publishers, viz: IVISON, BLAKEMAN, TAYLOR & CO., New York R. & T. A. ENNIS, St. Louis.

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To Manufacturers and Capitalists.

FLOWER PINS, new article of light wire, recently patented. First patent of its kind. Owing to the competition to obtain the American patent, I offer it at private sale to the highest cash bidder, at my price, a higher or lower one, whose bid is received before to o'clock p. m. on the 28th day of Feb., 1879. Bids can be sent by letter or telegraph, prepaid, no postal cards. Price, terms and all necessary information as to invention sent on application to responsible parties desiring to compete. Address,

J. H. PLUMMER.

126 Pacific street, Brooklyn, N. Y.

### Wanted to Purchase.

The Stock, Good Will, &c., of a good HARD-WARE STORE. Address "BUSINESS," 19 E. Street, N. W., Washington, D. C.

R. W. Cameron & Co.'s Pioneer Line, AUSTRALIA, NEW ZEALAND AND THE EAST.

ESTABLISHED 1852, Loading Borth, Pier 9 East River, Loading Berth, Fier V East Affect.
Freight forwarded to all ports in New Zealand.
Also to Melbourne, Sydney, Adelaide and Brisbane
in Australia. Cash advances made on approved
consignments. For freight or passage apply to
R. W. CAMERON & CO., 23 South William St., N. Y.

### To Manufacturers of Machinery,

Blackett & Davy, Engineers and Importers of Machinery at Sydney, offer their services to firms desirous of exhibiting good and useful articles of Machinery at the Australian International Exhi-bition in August next. Full particulars can be had by addressing

dressing
J. P. McCOY & CO.,
P. O. Box 390, New York.

# Special Notices.

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(Published by the author.)

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The Discount or Net on any amount of dollars and cents, from a penny to one million dollars, can be ascertained in a few seconds entirely by Addition. Just the thing for making or preving involves, finding Net Value of goods cought or sold, and comparing different Discounts, thereby saving time, blunders and Headwork.

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In due time the price will be advanced so as to afford a moderate profit. Merchants, Manu-facturers, Hookkeepers and Clerks now is your time. Send in your **Bollar** and receive the book by return mail. your time. Send in your s book by return mail. This book has a copious

### INDEX.

which is more for convenience than necessity, and would not be referred to one time in twenty.

Its principal use is to prevent confusion in finding combinations that are arranged in different orders; thus, the index shows that 25 and 7½ and 5 per cent. is found in the tables on page 12, under heading 25 and 5 and 7½ per cent.

Currency may be sent by mail at publisher

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One 9-inch Train Rolls, One 16-inch Train Rolls, Both with Housings. Two Steam Hammers, One Pair Shears, One Lot Steel 1 Bgot Moulds, Three Large Steam Pumps, Three Small Woodward Steam Pumps.

Three Small Woodward Steam
Pumps,
Two Hoisting Engines,
Three Steam Boilers,
One Lighthall Condensor,
One Surface Condensor,
Deck Pumps, Low Pressure Gauges,
Registering Gauges, &c.,

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### DANIEL W. RICHARDS & CO., Dealers in

Scrap Iron & Metals,

### 88 to 96 Mangin St., New York. Foreign Houses

mporting American Goods, and desiring the services of a reliable Agent at a moderate commission to attend to all their business in the United States, are invited to correspond (in English) with

Has had three years' experience as purchasing agent for Messrs. Wm. Marples & Sons, Sheffield and London, England.

Address S. H. JENNINGS,

### Deep River, Conn., U. S. A.

# Wanted, Position as Superintendent of Rolling Mill, by party educated as an engineer, but engaged for pasi nine years in practical rolling mill work. Possesses knowledge of chemical analysis necessary for the economical admixture of stock. Refers by per

Address A. J. MOXHAM, Louisville Rolling Mill Co., Louisville, Ky.

### AUSTRALIA AND NEW ZEALAND. Wm. S. Fell & Co.,

No. 275 George St., Sydney, Australia,

Request correspondence with American manufacturers desirous of being represented in the Australian Colonies or New Zealand.
Consignments solicited and prompt attention promised, and 6e day drafta against same for 50 per cent. through Bank of British North America, New York City, will be honored.
All the principal points in the Colonies are visited. All the principal points in the Colonies are visited regularly by our travelers.

# IMPORTANT NOTICE.

The Iron Works property of the

### Buffalo Iron and Nail Company, located at Buffalo, N. Y., one of the most com

plete establishments in the United States, is now offered for lease for five to ten years, on the mos liberal terms. Apply for proposition or catalogue to P. P. PRATT, of Buffalo. Here is offered an opportunity for co-operative organization, where the capital invested can be kept active, and not permanently invested in real estate. EXCHANGE.

Will exchange for stock of hardware, a fine farm of 277 acres in Loudoun Co., Va., on W. & O. R. R., 25 miles from Washington, having a large, commodious house, barn and out buildings, all new; sixty acres good oak timber, balance meadow, pasture and tillage; stream of running water, 400 assorted fruit trees (all grafted), 120 bearing grape vines, small fruits, &c. Address J. M. H., 1629 toth St., N. W., Washington, D. C.

WANTED—By a person experienced in the manufacture of White Lead, a position as Superintendent in some large establishment. Satisfactory reference given.

ory reference given.

WHITE LEAD,

Office of The Iron Age, 83 Reade St., N. Y.

### Special Notices.

# The Sherman Processico.

9 Pemberton Square, Boston, Mass., Issue Licenses to use the Process for the

Manufacture of Iron and Steel In the Bessemer Converter, Crucible, Siem Martin, Puddling, Blast and Cupola Furnace The use of this Process improves the quality of the product, saves fuel and labor, and does or quire any change in furnace or manner of working. See page 17 of The Iron Age of Oct. 25th, 1377.

# Price Books

BUELL LAMBERSON, No. 97 Chambers Street,

These books may also be had at publishers' prices of
WM. BLAIR & CO., Chicago,
A. F. SHAPLEIGH & CO., St. Louis, and
R. W. BOOTH & CO., Clincinnati, O.

## CALIFORNIAN AGENCY.

A San Francisco firm of File and Tool makers having an agent constantly traveling among the consumers in the State and West Coast, is desirous of representing some first-class Eastern Houses in anufacturing hardware trade.

Address AGENCY, 248 Beale St., San Francisco, Cal.

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Job Lots and Bankrupt Stocks Hardware,

Great bargains offered to the trade.

A. W. WHEELER. 141 Lake St., Chicago, Ill.

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An energetic young man with scientific training, who has had experience in the manufacture of Bessemer and Crucible Steel, in preference to remaining unemployed would be willing to take a subordinate position with the prospect of being employed as blower in Bessemer or as melter in Siemens-Martin steel works. Highest recommendation as to integrity, character and ability furnished. A correspondence, which shall be strictly confidential, respectfully solicited.

Address

33 West 35th St., New York.

SECOND-HAND MACHINIST TOOLS. SECUND-HAND MACHINISI IOOLS, 30 in.x12 ft. Engine Lathe; do. 24 in.x24 ft., Pond, nearly new; 23 in.x10 ft., good order; 18 in.x8 ft., Star Tool Co., new; 16 in.x6 ft., Ames Mfg. Co., nearly new; 16 in.x5 ft., Star Tool Co., new; 16 in.x6 ft., Ames Mfg. Co., nearly new; 16 in.x5 ft., Flathers; 13 in.x2 ft., Flathery Mch. Co., 14 in.x5 ft., Flathers; 13 in.x4 ft., Flathers; 20 in.x7 ft.; 14 in.x5 ft., Flathers; 13 in.x4 ft. Prait & Whitney, with taper attachment; 3 Spencer Hand Lathe; one 21 in.x4 ft. Hand Lathe; 1 square arbor Fox Lathe; one 23 in.x7 ft. Planer; 1 do. 26 in.x7 ft.; 1 do. 27 in.x7 ft.; 1 do. 25 in.x5 ft.; 1 Crank Planer, 11 in. atroke; 1 do. 22 in. stroke; 2 Profile Machines; one 10 in. Fitchburg Shaper; 1 N. Y. S. E. Co., 9 in., new; two 24 in. Hendy, new; one 15 in. Hendy, new; 1 hason Milling Machine, 12 in. atroke; 2 and 4 spindle P. Schlenker; 10 N. 25 and 6 Wilder Punch Press; one Schlenker; 10 N. 25 and 6 Wilder Punch Press; one Schlenker; 10 N. 25 and 6 Wilder Punch Press; one Schlenker; 10 N. 25 and 6 Wilder Punch Press; one Millers, new; 1 Screw Macvin Millers, new; 2 Hand Millers, new; 1 Screw Macvin Millers, new; 2 Hand Millers, new; 1 Screw Macvin Millers, new; 2 Hand Millers, new; 1 Screw Macvin Millers, new; 2 Hand Millers, new; 1 Screw Macvin Millers, new; 2 Hand Millers, new; 1 Screw Macvin Millers, new; 2 Hand Millers, new; 1 Screw Macvin Millers, new; 2 Hand Millers, new; 1 Screw Macvin Millers, new; 2 Hand Millers, new; 3 Schiellers; 10 Schieller; 10 Sch

E. P. BULLARD, 14 Dey St., New York,

## Machinery for Sale.

Wood-working Machinery, Steam Engines, Aucomatic and Variable Cut-off and Throttling Steam Engines, Boilers and Steam Pumps, Machinist Large stock on hand.

BELCHER & BAGNALL, 95 Murray Street, New York. GEORGE M. CLAPP, Manager.

### An Engineer and Machinist,

with twenty years' experience, is open for an eagagement. Is competent to take charge of a pubic building as engineer or janitor.

Satisfactory references can be furnished. Address. J. M.,

### Office of The Iron Age, 83 Reade St., New York. RESIDENT BUYER.

The undersigned, having had 14 years' experience in the Hardware trade—10 years in the wholesale and 4 years in retail trade—would act as resident buyer in New York for any out of town house or houses entrusting their orders to him. Is conversant with the Faint, Oil and Glass trade, and having had experience as a buyer for New York wholesale houses, considers himself competent to buy for out of town parties. Will attend to purchasing, forwarding and insurance of merchandise. All goods bought at headquarters, and special stention paid to orders for odd articles. Office and desk room at the service of correspondents when in the city. Correspondence invited as to facilities, commission or salary. The advantages in obtaining five or six correspondents are obvious, both as to reduced expenses and purchase of goods in large quantities. Unexceptionable references as to character and ability. Address HUYEB. undersigned, having had 14 years' experi

### Special Notice.

The undersigned offer their services as Agents to nakers of American Cabinet Hardware. They keep a full line of UPHOLSTERERS' AND CABINET MAKERS' MATERIALS. LOUIS WINDMULLER & ROELKEB, 20 Reade St., New York.

Address in Frankfort-on-Main, Germany, ERWIN ROELKER.

### Wanted,

Saleable Goods to sell to the HARDWARE AND STOVE TRADE, on Commission, by a first-class salesman, where no samples are necessary to be carried, or where they are, small. Address

P. O. BOX 1790, New York.

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### For Sale.

One Ferris & Miles' Two Ton STEAM HAMMER, nearly new, 48 inch stroke, 17 inch cylinder. Address, 93 Dearborn St., W. Chicago.

### FOR SALE.

To Close an Estate.

The works of the Chicago Plate and Bar Mil ., very valuable property, will be sold one-thir cost. Works all ready to start. Easy terms Address, J. M. AYER, 93 Dearborn street, W. Chicago,

# Trade Report.

Office of THE IRON AGE, WEDNESDAY EVENING, Feb. 12, 1879.

The financial events of the week have not been of an exciting character. Money continues very easy, and will probably so remain for some months to come. The rate on call loans is 2 @ 3 %, and on mercantile

paper 3 @ 5 %.
The sales of United States 4 per cent. bonds continue at the rate of about \$5,000, ooo per day, and since our last issue the Treasury has issued another call for the redemption of \$20,000,000 more 5-20 6 per cents., making \$190,000,000 called in since Jan. 1st last. Advices from Washington to-night indicate that a call for \$20,000,000 5-20 6 per cents. may be expected within a

The bond market is without any impor tant change since our last issue. There is an active demand for desirable railway investment shares. We give below the closing quotations of governments.

Silver in London fell during the week from 5od. per oz. to 493/d. @ 495/d., and the bullion value of the 412½-grain dollar here fell to about 83½ cents. The Treasury stopped buying silver deliverable at the Philadelphia mint, and has reduced its purchases to small weekly amounts, to be delivered at San Francisco and New Orleans.

In the stock market the course of prices has been irregular and speculation fitful, but prices have generally declined. The principal dealings have been in the strictly speculative shares. The market closes as

The bank return for this week shows a decrease of \$3,739,425 in surplus reserve, which now stands at \$14,137,875, against \$14,095,650 at this time last year, and \$21,-394,525 at the corresponding period in 1877. The loans show an increase this week of \$4,038,800; the specie is down \$784,000; the legal tenders are decreased \$2,913,400 the deposits other than United States are increased \$168,100, and the circulation is down \$59,500.

The following is an analysis of the bank totals of this week compared with that of

Loans	Feb. r. \$238,241,400 18,633,300	Feb. 8. \$242,280,200 17,840,300	Comparisons. Inc. \$4,038,800 Dec. 784,000
Legal t'nd'rs Tot. reserve. Deposits	54,048,800	51,185,400	Dec. 2,943,400 Dec. 3,697,400
Reserve required	54,804,800 17,877,300	54,846,825	

19,486,600 19,427,100 Dec. The foreign trade movements are shown in the following tables:

### IMPORTS.

For	week	ended	Febru	ary I	: 1	
		x1	377.	187	8.	x879.

Dry goods General mdse	\$2,070,650	\$1,958,119 1,891,563	\$3,286,258 5,344,360
Total for week. Prev. reported	\$4,570,886	\$3,849,682 27,554,481	\$8,630,618 24,185,884
Since Jan. 1	\$34,149,165	\$31,404,163	\$32,816,502
Included in articles valued			week are
		Quanti	ity. Value.

Quantity	. Value.
Brass goods12	\$1,754
Bronzes7	1,139
Chains and anchors7	262
Copper	8,118
Cutiery	65,001
Guns48	9,407
Hardware20	836
Iron, pig, tons200	2,548
Iron, sheet tons54	8,86x
Iron, ore, tons315	484
Iron, other, tons264	8,336
Load, ore327	910
Metal goods	19,941
Nails	1,690
Needles16	7,703
Old metal	5,998
Platina2	4,988
Plated ware	186
Percussion caps24	4,460
Saddlery	879
Steel	14,606
Silverware	117
Tin, bxs35,969	150,587
Tin, 8043 slabs	111,786
Wire7	1,331
Zinc83,281	3,827

For week ended February 8:	
Total for the week	\$494,70
Total since January 1, 1879	\$1,505,64

EXPORTS, EXCLUSIVE OF SPECIE.

For week ended February 11: For the week... \$4,977,839 \$6,949,877 Prev. reported.. 28,912,598 30,899,860

Government bonds at the close were quoted

Bid.	Asked.	
U. S. Currency 6's	32134	
U. S. 6'8 1881 registered	2061/8	
C. C. O'S 1881 COUDON	1061/8	ı
U. B. 6'8 1867 Peg	1021/8	Į,
U. 8. 6'8 1867 COH	1021/8	
U. B. 6'8 1868 reg	103	1
U. 3. 6'8 1868 COM	203	ĵ
U. S. 10-40 reg	202%	ľ
U. B. 10-40 COUDON 10436	105	١,
U. B. 5'8 1831 registered	10436	-
U. 3. 5'8 1881 Coupon 10436	20412	ď
U. B. 4% B ISOX registered	X04 7/8	
U. B. 4% B ISOI COUDOD.	106	
U. B. 4'8 1007 registered	1001/8	1
U. S. 4's 1907 coupon	1001/8	1
The following are the closing quo of active shares:		-
Bid.	Asked.	e
Atlantic and Pacific Telegraph 37%	3874	1
Canada Southern 55 Chicago and Northwest 6114	56 6134	á
cuicago and Northwest 61%	6134	ľ
Chia Pref 865%	8634	
Chicago, Rock Island and Pacific 129%	130%	á
Cont., Chicago and Ind. Central	6	A
Clev., Col., Cin. and Ind 44%	4423	State of Street
Cleveland and Pittsburgh93 Chicago and Alton36	9323	1
Calcago and Alton	8636	18

Express Adams	
Amorico-	106%
American 4834 United States 4772	491/2
Wells, Fargo & Co 9634	48%
Erie 9638	98
Erie preferred	25%
Harlem48	
Harlem 156 Hannibal and St. Joseph 15	238
Illinois Central Pref. 42	15%
	8514
ake Shore 6034	6976
Michigan Central 9974 Milwaukee and St. Paul 4056 New York Control Pref 82	88
Hilwaukee and St. Paul 401/2	40%
Pref 82	8214
	336
New Jersey Central 4414	4436
and and attestisappi	12%
Ohio and Mississippi 44% Pref 35% Cacific Mail 134	36
anama 1374	13%
ittsburgh and Fort Wayne 106	334
	107
	36
	16
t. Louis Kansas City Northern 814	836
" Pref 35%	35%
utro Tunnel	33/6
nion Pacine	6674
	99%
Vabash arsk	2134
Iome Mining 25½	25%
The late of the la	1015
GENERAL HARDWARE.	
THE REAL PROPERTY OF THE PARTY	

We notice this week increased activity in the Hardware trade, with very few changes in prices. We hear of some discount sheets in course of preparation.

The demand for foreign Hardware is fair for the season, and some good-sized orders for importation have been placed during the week. In this branch of the trade there are no fluctuations in values to report.

The demand for Nails is a trifle more ac tive on local account than at our last writing, but there is little vim to the business, and without being able to quote any change in the market price, there seems to be a tendency toward weakness. We continue to quote 10d. to 60d., \$2.10 @ \$2.15, net, ac-

cording to quantity.
On another page we print some interesting particulars regarding the tariff of the Netherlands, recently received by the State Department, which is worthy the attention of manufacturers.

We have received the following circular

PHILADELPHIA, Feb. 12, 1879.

Gents: We advise you that parties in this city, and perhaps elsewhere, are now put ting on the market Jail Locks in outside appearance something like our own. The cap of these Locks are merely held in place by a pin that is concealed by the paint, and they are made wholly and in every part of ommon cast iron, that can be crack a nut, and offers no security. Our Jail Locks are made from best malleable iron in every part, and their great security and low arice have given them arice have given the said to these cast imitations.

WM. H. Sowers, have given them large sales, and thus

410 and 412 Commerce street. Clark & Co., Buffalo, N. Y., have issued a revised edition of their Illustrated Cata-logue and Price List, under date of January 1, 1879. The following is their discount

Discount Sheet, January 1. 1879.

Terms: Strictly cash in 30 days, with exchange on New York. All unsettled accounts at maturity are subject to draft at sight, without notice. Prices net guaranteed, and subject to change without notice.

					er cont.
Door Butt	R. Panele	d. Loos	e Pin, I	Drilled	75
44	66		4	" Japd	75
66	44	4	4	" Berlin b	FDZ8.64
86	64		18	" Nickel p	
Blind Hing	res. Surfa	ce Nos	1. 3 &		
64	good someon	\$4	20, 40 8	45	.75810
4.5		86	go, Buf	. Noiseles	9.758 10
66		44		*********	
64	Mortis	ie Nos.	2. 4. 416	, 6. 8 & ro	64
Shutter H	nees. Mo	rtise Ir	DDFOVE	d. Nos. 3.	214.
2 114 7	t o				.700 10
Gate Hing	es Nos r	2 2 W	ith Lat	ches	. 506 10
di di	Nos v	& 2. W	thout I	Latches	. 508 10
Gate Latel	es Reve	rable.	No. r.		. 500 10
Crave Lance	Ruffe	lo Patt	ern No	. 4	. KOATTO
Thumb an	d Door La	tchess	nd Pul	la	. 508 10
Star Stove	Pine Da	mpers.			50
"The Cool	egt " Stor	re-Lid I	ifters.		40
Mon Head	a (se dog )	ner do	w	ne	t. Sr. 24
Diamond I	fon and	Brush H	folders	(xz doz) De	3.6
dog 2	aop and s	DI GEORGIA		ne	t. 1.25
Window Po	Move No	W TO 20	20 870	1.40	33
William E	to Be	as ro, so	Wheel	No. 50	20
44	6 Po	lished	44	No. 60	30
Sash Lock					
Hooks, W	androbe	Coat	Hat	Harness	and
School-h					
Sash Cord	Trong D	oked a	erross i	n a namer	how as
Hand Flut	Page	rod cin	gly in r	aner hor	ner
				mper box,	Burg.
doz	*******				20

Above discounts are for full cases. When less than a case of each article is ordered the discount will be less, and a small charge added for the case containing the goods. A small charge will be made for cases containing Door Butts in every instance. If favored with your order, it will savery truly, and careful attention. Yours very truly, CLARK & Co.

D. W. Hazleton & Co., Philadelphia, have issued, under date of January 1, 1879, the following price list of Curry Combs manufactured by them. Their terms are as follows: "Net cash, payable in Philadelphia or New York par funds within 30 days; bills not settled within 30 days from date of invoice are subject to draft at sight. Since Jan. 1.... \$33,890,437 \$37,849,737 \$34,302,463 If paid within 10 days, 2 per cent. will be allowed. Under date of 7th instant, they quote discount 50 per cent. from this list ;

BEACH'S PATENT CURRY COMBS.

Open Backs, Red Handles. Japanned. Tinned. Brass Bars.

No. 7, 6 Bars	2.5
No. 9, 8 "	3.0
Wire Frames, Close Backs, Red Handle	8.
Japanned	
No. 4, 6 Bars	R. R
No. 6, 8 "	1.5
Tinned.	
No 40 6 Bars	I.I
No. 40, 6 Bars	1.5
Rrass Bars.	
No. 20, 6 Bars	2.7
No. 18, 8 46	3.2
Straight Shank, Yellow Handle, One Knock	er.
No. 66, 6 Bars, Japanned	8.5
	1.9
210. 0/1 0	1.9
27 a a 4 Winned	X.O
No. 89, 8 No. 400, 8 Bars, Japanned, Open Back	2.2
No. 490, 8 Dars, Japannett, Open	3.0
No. 483, 6 4 Tinned 4	2.3
No. 450, 8 "Tinned Close Back"	. 2.6

Straight Si	hank, Oval Face, Polished He	andle.
THO. 70, O DIEL	s, Japanned	I.70
No. 90, 8	Japanned	9.15
No. 91, 8 "		2.15
Riveted.	n, Trowel Shank, Oval Face, I hank runs through Handle	and is
No. 1000, 6 Ba	rs, Extra Heavy Japanned	
No. 1050, 6 4	" Tinned	
Oval Face	e, Trowel Shank, Bronze Han	1.90
No. 800. 8 Bar	s, Extra Heavy, Japanned	
No. 850, 8 "	Tinned	2.50
		2.50
No troo 6 Ba	lack, Broad Bar, One Knock	er.
No rero 6	rs, Japanned	
Own! Face	amned	2.00
No for 9 Don	Straight Shank, Enameled He	indle.
No. 233, 8 "	s, Jap'd. Shell, Tinn'd Backpl'	te 2.75
210. 233, 0	runed " Jap'd. "	2.75
end.	ronze Handle, Wrought Iron, ning through Handle with	Ring in
No. 1300, 8 Ba	rs, Extra Heavy, Japanned	2.75
No. 1350, 8	" Tinned	2.75
	, Wrought Iron Back and	Shank
No. 333, 8 Bar	3. Japanned, Ornamented	3.00
No. 334, 8 "	Tinned "	3.00
	eld Block Works, Lockno	3.00
THO T OHL	THE DIRECT WOPER LOOPING	sed NT

Y., illustrate, in their advertisement on the 35th page, a new style of block, intended for the use of farmers, in connection with Horse Hay Forks. It is constructed to admit and pass a knot in a rope without obstruction, thereby obviating the necessity of splicing when a rope gives out in use, and saving the annoying, and often expensive, delays caused by such accidents. They have now ready two styles, with polished grooved iron sheaves, either plain or rollersushed steel pins. The list price of these blocks is given below, and is subject to discount 20 per cent. to the trade.

No. 511, Common 5-in, Sheave Loft Block . \$
No. 512, Patent 5 in.
No. 507, Common 5-in, Lead ...
No. 509, Patent 5-in ...
No. 509, Extra Bases for ... Henry B. Newhall, No. 11 Warren street.

is agent for these goods in this city.

The Shepard Hardware Co., Buffalo, N. Y., have issued, under date of 12th inst., an appendix to their catalogue of builders' and miscellaneous Hardware manufactured by them, in which they illustrate some recent patented improvements in Hand Fluting machines. The machine to which they invite attention is styled "Shepard Hand Fluter No. 75," and is protected by patents dated November 12 and December 17, 1878. It is nickel-plated, and has two heaters; the size of the roller is 21/2 x 31/4 inches, and the corrugated plate is 61/2 x 31/4 inches. This new pattern 1870 machine is thus described by the manufacturers :

This Fluting Machine is made with a recessed stand, which contains the heater, and upon which the corrugated plate is placed. Two heaters are furnished with each machine, thus enabling it to be used continuously without delay for heating. We have completed new patterns for this machine throughout, making all parts new, and greatly improving the entire machine. The extra large iron roller (being more than double the ordinary size) is now of a uniform diameter, and also longer than heretofore, and the "filutes" (or teeth) of both the roller and plate have been made more blunt. The corrugated fluter plate is provided with raised lips at each end, which cause the roller to rise before it reaches the end of the plate, thus enabling the operator to feel when the end of the plate is nearly reached, and preventing the roller from being pushed over the end of the plate when in use. This improvement (for which we have also reextra large iron roller (being more than over the end of the plate when in use. This improvement (for which we have also recently obtained letters patent) entirely obviates all liability to tear or otherwise injure even the finest of fabrics, such as lace, &c. The fluter plate has also been made wider and otherwise improved. The fluter stand is ornamented and presents a handsome appearance. The handle is made of malleable iron, and has also been improved. Great care has been taken to make machine that is not liable to be broken or oget out of order. The roller and plate a machine that is not hable to be broken or to get out of order. The roller and plate are polished and nickel-plated in a superior style of workmanship. The handle and fluter stand are neatly japanned.

No. 75 Shepard Hand Fluter, Nickel-plated, and including two Heaters, per doz,...... Each Fluter packed in a paper box, and in cases of one dozen.

The Goulds Manufacturing Co., Seneca Falls, N. Y., have issued the 17th edition of their descriptive eatalogue and price list of Pumps, Engines, Rams and other Hydraulic
Machinery, Iron goods, &c. It contains 224
pages, and is clearly and comprehensively
illustrated. Introducing the book they say:
"In this our new illustrated catalogue and
price list, we offer to the favorable notice of Pumps, Engines, Rams and other Hydraulic price list, we offer to the favorable notice of the trade a very large and useful assort-ment of Suction and Lift Cistern and Well company in this city is at No. 15 Park place.

2.50 tion to order.

Q. S. Backus, No. 102 Chambers street, illustrates, in his advertisement on page 21, some leading patterns of the Backus Patent Bit Braces, Angular Borers, &c. These goods have been on the market for several years, and are favorably known. The manufacturer claims that for simplicity of construction, effectiveness, quality and finish they will compare favorably with any similar goods on the market. Mr. Backus informs us that largely increased facilities, recently obtained, enables him to offer, in addition to his usual assortment of Braces, a full line of heavily nickel-plated goods, comprising Ratchet Braces, Ratchet Extensions, Straight Extensions, Angular Borers, &c., at lowest market rates.

The letter of our English correspondent, containing interesting matter on the subject of American Locks in England, in our issue of 6th inst., has called forth the following reply from the president of The Branford Lock Works:

New York, Feb. 12, 1879. New York, Feb. 12, 1879.

To the Editor of The Iron Age.—I notice in the letter of your London, Eng., "Regular Correspondent," on "The Great Lock Question," that Mr. Vaughn makes a series of assertions relative to American locks, and, among other statements, says: "Last summer we had the pleasure of conducting Mr. Littleiohn over our works at ducting Mr. Littlejohn over our works at Willenhall. After what he saw he expressed surprise that the American locks should sell at all in our market. I pointed out to him the insecurity of their locks, and he admitted that the bulk of the locks were not made to prevent burglary; but that if a person tried a door, and found it apparently fastened, this is an intimation to him that the place was private, and he must not use force to obtain an entrance. Further than this, he admitted, they had no regard for

security.
"Mr. Kennedy, of the Branford Lock
Works, near New York, also paid us a visit, and he confirmed the statement made by the other gentleman."

I am not authorized to speak for Mr. Littlejohn, and am not responsible for what he admitted; but I cannot permit Mr. Vaughn, or any other person, to misrepresent me in England or elsewhere, and I feel unwilling to believe that Mr. Vaughn has any disposition to do so.

When in England last summer, I called on Vaughn at his extensive works at Willenhall, was courteously received, and our conversation was unreserved, and I think frank on the part of each. I had with me only a single lock, and that was the poorest and cheapest I make, viz., single tumbler iron rim lock. This we compared with his iron rim lock. This we compared with his cheapest lock, and I found that mine com-pared favorably with his, although I could ell my lock in England at about one-half the price he was realizing for his cheapest locks. During the conversation he expressed surprise at the smoothness of my castings, at the excellent japan finish, and we both concluded that I used better sand for molding and japan for coating. On my return to America, I, at Mr. Vaughn's request, sent him a barrel of sand and two gallons of japan, of the quality used by me at the Branford Lock Works, in Branford,

I deny that I "confirmed the statement made by the other gentleman," and I assert that American one-tumbler locks are as secure as English one-tumbler locks, and I offer to furnish them at greatly reduced

Knob locks have become cheaper than Norfolk latches, and consequently have, in a great measure, been substituted on aca great measure, been substituted on account of the better finish given to doors and the advantage of turning a key, and thereby giving "an intimation that the place was private." If such locks form the bulk of sales in England or America, it is for the reason above given, viz., their near cost to door latches, formerly so much used; but I am not willing to concede that such are "the bulk of the locks" used in America, or will be in England when I get through with will be in England when I get through with the market, because I intend to demonstrate

### IRON.

discounts more uniform and fewer, descriptions clear and intelligible, and the illustrations as faithful representations of the goods transpired, but particulars are withheld, as the most skillful engravers can make and the feeling gains ground that so far as them." The book is bound in flexible cloth price is concerned, Iron has touched bottom. cover, and the paper, composition and press-work are all first class. The office of the in the Lehigh region is about 16, and this, The number of furnaces at present in blast out of a total of 43 furnaces, shows that pro-The Brown & Sharpe Mfg. Co., and duction at the present time is within very Darling, Brown & Sharp, both of Providence, R. I., have issued their 1879 comfurnaces, owing to the failure of their Darling. Brown & Sharp, both of Providence, R. I., have issued their 1879 combined catalogue and price lists of Machinery and Tools, United States Standard Rules, Cast Steel Try Squares, Standard Wire Cast Steel Try Squares, Standard Wire Gauges and Tools of precision, for the use of Under these conditions, and in view of the consumption and inevitable shrinkage. To-Gauges and Tools of precision, for the use of Under these conditions, and in view of the Gauges and Tools of precision, for the use of Machinists and others requiring accurate measurements. Brown & Sharpe Mfg. Co. are prepared to manufacture special machines, patented articles in the line of machines, patented articles in the line of machines of the greatly improved feeling noticed above tion to order.

Under these conditions, and in view of the consumption and inevitable shrinkage. Today's values are: English Pig, £14; ditto matter of Iron are very large, and that stocks are ordered to the matter of Iron are very large, and that stocks are conditions, and in view of the consumption and inevitable shrinkage. Today's values are: English Pig, £14; ditto matter of Iron are very large, and that stocks are conditions, and in view of the consumption and inevitable shrinkage. Today's values are: English Pig, £13, 15/; Spanish, £13, 15/; Sheet, £15; Pipes, £16; Pipes, £16; Pipes, £16; Pipes, £16; Pipes, £17; Pipes, £18; Pipes, £18; Pipes, £19; Pip

creased activity at an early day. We quote Foundry No. 1, \$16.50 @ \$18; Foundry No. 2, \$15.50 @ \$16.50; and Gray Forge, \$14.50

Scotch Pig-The business in Scotch Iron during the week has been of a very trifling nature. No new arrivals are reported. We quote Eglinton, \$19.50 @ \$20, and Coltness,

Rails.-Nothing in the way of new business, either in Steel or Iron Rails, is reported since our last writing. We hear of considerable inquiry for Steel, and report the market firm at our quotations. We quote Steel at mill \$41 @ \$42, and Iron \$32 @ \$36, according to quality, section, terms,

Old Rails.—The only transaction in Old Rails which has come to our notice during the week, is the sale of 2,500 tons on private terms. We continue to quote \$19.50 @ \$20 here.

Scrap.—We hear of a sale of 150 tons Wrought Scrap on private terms. We quote No. 1 Wrought from yard \$21 @ \$22.

### METALS.

Copper.—Business in Copper continues to be quite slack, and sales effected have not be quite stack, and sales choosed that a exceeded 125,000 @ 150,000 pounds Lake Superior at 15½¢, which is the closing figure. Raltimora is nominally worth as much. ure. Baltimore is nominally worth as much. We copy from the London Mining Journal, of January 25, the following: "This metal has only undergone very slight variations, and the demand still continues very instal has only undergone very sight varia-tions, and the demand still continues very limited. Prices, however, are greatly in favor of buyers, who should not hesitate in taking advantage of them while they con-tinue so low. Chili Bars have been bought time so low. Chill Bars have been bought during the week chiefly at about £56.15/@ £57 per ton, cash, at which price some fair sales have been made. The Wallaroo sale is fixed for Tuesday next, when 802 tons will be offered by public auction, and immediately afterward 220 tons Burra will be sold. ately afterward 220 tons Burra will be sold. The present quotation for Wallaroo is £66, and for Burra £64 per ton, but these quotations are merely nominal, as no fixed price can be quoted until after the sale is over, and the result made known. The quantity of Wallaroo is 224 tons over and above that offered last November. The prices that will offered last November. The prices that will be realized next Tuesday can hardly be expected to be satisfactory to sellers, owing to the present dull state of business." Nothing new has come to hand in addition to this by cable, and the presumption is that there is no change since. Manufactured is in limited change since. Manufactured is in limited request at combination prices. Copper Bottoms have been included in the combination at 26¢ % B, with a reduction of 1¢ % B to the purchaser of 2000 B from one manufacturer within 6 months; this reduction is to be made at the end of this reduction is to be made at the end of each 6 months, terminating June 30th and Dec. 31st of each year, and only upon the written statement of the purchaser that he has not sold Bottoms at a lower price than the highest rate fixed by the Copper Bottom Association. New Sheathing Copper, 22¢; Braziers, 24¢, and Bolts, 24¢; Bottoms, 26; American Yellow Sheathing Metal, 13½¢; Yellow Metal Bolts, 20¢, and English Yellow Sheathing Metal, 12¾¢ @ 12¾¢, currency, in bond.

Tin.—there has been no essential change

Tin.—there has been no essential change Tin.—there has been no essential change in our market since last week, and we quote Spot Straits, 14¾¢@ 15¢; English Refined, none here; Common ditto, 13½¢@ 14¢, and Banca, 18½¢@ 19¢, all large lines. There is but little inclination manfested to buy Straits Tin afloat; the jobbing demand has, however, been quite fair. Singapore and London prices are unchanged. The arrivals have been exported from Australia and There have been exported from Australia to There have been exported from Australia to England in January 800 tons. The deliveries in England and Holland in January have been 1400 tons. The stock in London have been 1400 tons. The stock in London February I was 9500 tons. About 100 tons Straits Tin, bought in London, are affoat for New York and due in a week. The situation in the London market is described by the Mining Journal in the following terms, under date January 25: "The quotations for Tin appear to be rather on the decline, purchases the market, because I intend to demonstrate the fact that American two and three tumbler locks are more secure against burglars, are more tasty in design, more durable for use and far cheaper than the same grade of English locks.

If there are parties interested on this subject, they are requested to call on Lloyd Lawrence & Co., No. 12 St. Mary Axe, London, E. C., and examine the goods recently sent them for sale at the risk of the company I represent. I purpose to continue there are hardened.

Tin Plates.—A large business on Western orders within the last week the market closes firm, with a moderate amount of activity. The English market is as strong as ever, and many makers decline to name any prices at all. Taking at ran-dom the first brand we can lay our hands the trade a very large and useful assortment of Suction and Lift Cistern and Well Pumps, Force Pumps, Rotary Force and Fire Pumps, Rotary Gas Exhausters for Gas Works, Gas Pumps for Oil Wells, Hydraulic Rams, Garden Engines, Patent Chilled Skeins and Boxes, Steel Amalgam Bills, Burrall's Corn Shellers, and other Iron goods. We have revised and modernized our prices, made the list more consistent, discounts more uniform and fewer, descripdiscounts more uniform and fewer, descripdiscounts were uniform and fewer, descripdiscounts with the first brand we can lay our hands on among those just cabled, we find that for instance the "Old Castle" brand ver fall on among those just cabled, we find that for instance the "Old Castle" brand ver for instance the "Old Castle" brand we can lay our hands on among those just cabled, we find that for instance the "Old Castle" brand ver for instance the "Old Castle" brand the Iron market which we noticed last week, has become more general and has expanded into considerable business. The Thomas Internet and the Iron market which we noticed last week, has become more general and has expanded into considerable business. The Thomas Iron Co. report sales of 13,000 tons Nos. I last did not command over 14/, What precedes will abundantly explain the stiff-ness reigning at New York, where we quote last week. We also have for instance the "Old Castle" brand we can lay our hands on among those just cabled, we find that for instance the "Old Castle" brand we can lay our hands on am chases have been made at the advances noted in our last, and these, coming on the top of a stiff market, have further strengthoned values. As buying still continues, further increases seem probable; and in any case the position of makers' order books is such that there is hardly any chance of reduction for the next two months at

Lead-This metal is as apathetic as can

Francisco Commercial Herald, in its annual

TWPORTS

Lamarche H.
Rolled zinc, cks., 15
Phelps, Dodge & Co.
Tin plates, bxs., 10,

Francisco Comm	nuar	v 30, prints the	follow	- Control of the Cont	AS STATE OF THE PARTY AND
ing statistics of	the	Lead shipments	durin	g Of Hardware, Iron, the Port of New York	
To New York	1911/16	Tons.	Value \$902,37	Feb. 11, 1878:	and the of the state of the state of
ChinaJapan		4,775	\$902,37 393,80 27,79	Daldwin Bros & Co	Gun caps, cs., 2 Gun wad, cs., 8
Victoria England, &c			25,00	Gun barrels, cs., 2 Duvckink W. C.	Cases, 3
Totals		antic ports via	1,351,90		Waite E. J. & Co. Ore, 300 tons.
Shipments to during 1878:		CALIFORNIA STATE		Mdse., pkgs., 5 Hopkins E. T.	McKesson & Robins, Pig, tons, 100
Antimony		Pounds 77,184	\$6,69	May C. W	Milliken & Smith.
Silver ore		845,475	267.9	8 McCoy & Co.	Wire rods, bdls., Robertson, Thomas
Base silver bullion		-	1,250,16	Moore's J. P. Sons,	Boiler tubes, 200
Spelter and	Zin	cCommon D	omesti	c Noyes, Smith & Co.	Order, Ore, tons, 373
Spelter has been and none but tr	ifling	sales have tran	spired	Mdse., pkgs., 2	Steel. Prosser Thos. & Sons,
We quote the sa Refined, 814 @	me ne	ominally, 456 @	04366	Arms, cs., 11	Tires, 4 Bundles, 53
Lahigh ore. of.	and	1 Silesian, 5 34 ¢	. Th	e Spies, Kissam & Co.	Cases, 8
following is from	a limi	ited demand an	d sale	8 Struner, Lau & Co.	Bundles, 55 Order,
are very few, H £12 % ton." A	ard t	being procurable	e belov	Wetzlar M.	Bundles, 60
61/4¢.				Co.	Byrne Joseph & Co.
Mickel.—No demand is mode	chang erate	e has taken place, on the basis of	ce: th	el Cutlery and Hdw.	Tin plates, bxs., r: Hopkins E. T.
for Wharton's.		ins inactive at		Witte John G. & Dio.	Tin plates, bxs., 74 Lamarche H.
@ 123/sc., accord	ding	to quantity and	brand	Whetstones, cs., 10 Boker Hermann & Co.	Rolled zinc, cks., r Phelps, Dodge & Co. Tin plates, bxs., r
	EXP	ORTS		Hdw., cs., 19 Hdw., cks., 3	Order,
Of Handspare.	Iron	Machinery.	Metals	Order,	Lead, pigs, 400 Tin plates, 385
&c., from the Week ending I	Port	of New York,	for the	-	
Christinia.		British Posse	ession	COA	L.
Quan. V	Talue.	in Africa	Value	The state of the m	
Ag. imp., pkgs 76	210	Hdw., pkgs 40	55 3.04	of note. The mild w	eather has prevente
Hdw., cs 30 St'p'd ware, cs 7	376	Ag. imp., pkgs ic Cge. mtl., pgs.			
Rotterdam. Petlm., gal. 283, 256	30, 300	Hdw., pkgs		domestic use seems to	have been fairly good
Antwerp.	,,,,,,,,	Copper, cs	2 86 1 5	delay in obtaining it.	The amount comin
Ag. imp., pkgs 3 Glassware, cs. 3	250 85	British Guid	5 61:	forward is exceedingly	small, and is all sole quantity of other
Hamburg.	-3	Hdw., cs	x 86	sizes coming to marke	et is good, and som
Revolvers 4	1,318	British West 1		advance of their usu	al tonnage. Other
Copper, cks 18 Pl'd ware, cs 2 Mf. iron, pkgs 61	3,265 154 1,310	Glassware, pgs 1 Ag. imp., pkgs	7 130	are supposed to be be	ringing down about
Sew. mach., cs 27 Mach'y, cs 15	435 1,720	Mf. iron, pkgs r Tinware, cs r Nails, kegs ro	4 465	The result of this	is, that the large
Glassware, cs. 3 Knit'g. ma., cs. 14	200 1,675	British North		and are selling at all so	rts of rates, depend
Tinware, cs 9 Ag. imp., pkgs 422 3 Windmill 1	310 35,361	tean Coloni		ing upon the man, his as a merchant and a	means, his characte dozen other things
Be ting, bales. 6	1,040	Petim., gals3750	500	The determination of strong, and if a man w	the dealer to sell i
Brass, cs	430	Hdw., pkgs 46	9 10,873	likely to obtain it no	matter what his cir
Wringers, bxs 69		Petim., gals. 40.83	1,233	cumstances may be. In supposed to be about	the same as those or
Bristol. Mach'y, cs 2	280	Mule shoes, car re-	107	the auction sale. East bare of Coal, and on ac	ern markets are very
Bremen.	-	Nails, kegs roc Revolvers, cs. s R. R. mat., pgs 401	320	freights not much Coal	is going in that di-
Mach'y, case. 1 Ptlm., gals. 260,000 2.	130	Mach'y, pgs. 25 Mf. iron, pkgs. 28	11,274	rection. Boston is quother ports in propor	tion, and naturally
Ag. imp., pgs. 156 Nick'l h'ldr's, cs. 1		Cutlery, pkgs. 46 Ag. imp., pgs. 11	1,874	only Coal enough is ship diate and pressing neces	pped to supply imme
Glassware, cs. 1	120	Belting, pkgs.	500	probable that such rate	s can continue for
Hdw., cs 72	3,899	Nails, bxs 21 Plum, mtls., cs 1	IOI	any length of time, and we may expect a brisk l	
	800 1,301	Cisplatine Rep	ublic.	-	
Pit'dware, cs 2 Mach'y, pkgs. 118	440	Ag. imp., pkgs 225 Hdw., pkgs 208 Shoe nails, bxs 100		OLD METALS, PAI	
Pistols, cs 4	255	Chaoka & h was		Lead and Newspapers stock moving in this ma	
Elect. plts., cs. 8 3	,000	Mach'y, pkgs. 4 Mf. iron, pkgs 35 Pumps, pkge. 1	561 30	In other articles we have to report.	no material change
Hull.	. 1	Sew. mach., cs 4	90	The purchasing prices	
Ag. imp, pkgs. 25 Hdw., cs 15 Sew. mach., cs 70 1	244	S'ndp'p'r., cs 5  Argentine Repr		for Old Metals are as fol Copper, heavy	
Metal g'ds, cs. 50 I	,540	Petlm., gals.50,000 Burners, case. r		Copper Bottoms Yellow Metal	10½ @
London. Ag. imp., pkgs 307 1.	13	Mach'y., pkgs. 6 Mf. iron, pkgs 295	369 1,104	Yellow Metal.  Brass, heavy.  Brass, light  Composition, heavy.  Lead, solid.	00 1/2 @
Mach'y, cs 48 6.	,538	Ag. imp., pkgs 88 H'dware, pgs. 3	2,549 295		44 .03¾ @
Nails, cs 8 Sew. mach., cs 100 1,	160	Hdw., cs 50 Glassware, pgs 17	370	Tea Lead	.03½ @
Pit'd ware, cs. 2 Car wheels 4	500	Chili.		Zinc. Pewter, No. 1 Pewter, No. 2. Wrought Iron. p	" .10 @ " .08 @ / rton, \$16.00 @
Mf. iron, pkgs. 6 Glassware, cs. 43	744 I	Mach'y, pkgs 5 Ptlm., gals80,coo Nails, kegs1500	9,760	Stove Plate	" 0.00 @
Oil stones, cs. 3	78	Porto Rico.		Machinery do	" 11.00 @
Exeter. Ptlm., gals. 48,772 7	803	Hardware, cs. 41 Plt'd ware, cs. 56 Mf. iron, pkgs 4	572 3,450	The prices current for follows .	Rags, &c., are as
Gibraltar.	1 2	sew. mach., cs. 2	98	Canvag Linen	per D. 3 c. @ 3%c.
Petlm., gals.45,000 5,	1.0	Petim., gals7497 Nails, kegs 79 Shooks & h1350	923 204 1,200	White, No. 1	4½C.@ 1½C.@
Glasgow. Mach'y, cs 6	860	diassware, cs. 50 Cutlery, cs	498	White Cotton, New	3½c. @ 3¾c. 2 c. @
Mf. iron, pkgs. 6 Relting, bales, 18 2.	833	Mach. oil, bbls	374	Soft. do	" 6%c. @ 7 C.
Hdw., cs 9	347	Ag. imp., pkgs 4 United States of	170	Gunny bagging	
Needles, cs 1	937	lombia.		Newspapers	" 2½c. @
Havre.	1.5	Brass kettles. 200 Sew. mach., cs 120 Cutlery, cs 224	3,018	Waste Paper and Scraps	
Copper, casks 186 44, Mach'y, cs 34 2, Silverware, cs 1	325 ( 400 I	Cutlery, cs 274 H'ssware, pgs 111 Mf. iron, pkgs. 120	5,403 1,045 740	Tarred ShakingGrass Ropa	" 1 C. @ 1½C.
Delvo ceals, cor. cor 24.	270 3	Pistols, es	335	Messrs. Du Plaine &	Co., Philadelphia,
Brit, ware, cs. 3 Hardware, cs. 5 Ag. imp., pkgs1682 52,	624 I	Revolvers, cs. 8	832	quote the market prices fellows:	
Rouen.	3	Pickeil'r, fl'sks, 6 Brit, ware, pgs	1,468	Heavy Old Copper	Cents 19 1b.
Ptlm., gals. 192,853 16, Valencia.	1	Wire, pkgs 22 Ptlm., gals11,225	231	Heavy Old Copper Light Tinned Copper Copper Bottoms	12 @
Ptlm., gals. 149,673 16,	_ 1	Hardware, CS. 120			
Dutch West Indie	I	Ag. imp., pkgs 18 H'dware pkgs 4 Shot, cs 39 Powder, lbs2322	62 260	Heavy Red Brass Scrap Light Red Brass Scrap Heavy Yellow Brass Scrap Light Yellow Brass Scrap	9 @
Cutlery, cs 7 Hardware, cs 1	30 1	er caps, cs., a	62	Old Junk Lead (melted in m	378 (6
Danish West Indi	es. j	Nails, kegs 35 Mf. cop'r, cs 2	134	New Zinc Clippings	314 @
Hdw., pkgs 13	264	Haytt.	- 1	Old Better Zinc	3 @
Ptlm., gals3,770 Sew. mach.,cs 3	39 F	Nails, kegs 12 Petlm., gals8548	1,149 30 1,158	Old Battery Zhic. Plumbers Lead Joints. No. 1 Pewter No. 2 Pewter Old Type Metal Red Brass Turnings. Vellow Regs Turnings	
Nails, kegs 40	129	dach'y, pkgs. 95	308	Old Type Metal	
Marseilles. Sew. mach., cs 101 1,	· k	Mexico.	09	Spelter Dross	1/6 @ 71/6
Bilboa.	F	tlm., gals. 18,640	2,515	Lead Dross Stereotype or Electrotype Pl	ates 4 @
Ptlm., gals. 131,326 11,	400 F	Idw., cs 166	3,116	-	
Cadiz.	701	sew. mach., cs. 84 lg. imp., pkgs 71 fach'y, pkgs. 98	1,314	PHILADEL Office of The Iron Age, 220	
	375 8	older, cs 2	5:733 III 45	Office of The Iron Age, 220 PHRADELPHIA, The general condition	
Glassware, pgs 17 Grindstones . 120	336 C 57 8	hot, kegs 8	3,051	The general condition ues to show signs of a hear	althy reaction, and
R R mtls, pgs. 1052 10,	53× I M	ir, iron, page 44	240	in nearly all the leading stablishments there is	a considerable
Twom cofe I 3.	182 A	el. mtls., pgs 18	-,-	establishments there is amount of work going or more widely distributed t	1. The activity is
148HR K6Rg**** 320	02 F	er caps, case I	55	a de la constantion de la cons	HOUR OF BOOM

Alexandria,

Ptlm., gals. 121,000 14,600

Africa. Ptlm., gals. 245,000 29,40 Fenezuela.

25 46

Petim., gals ... 4214

Glassware, cs. Mach'y, pkgs. Sew. mach., cs. Hardware, cs.

	full time. The Midvale Steel Works, the Standard Steel Works, the Edgemoor Iron Company, the Phonix Iron Company, as well as the large machine tool establish-
9	ments, are all full of orders. The car build- ers are also liberally supplied with work, and at the moment it would be difficult to
	say what concerns are slack, rather than otherwise. Shipbuilding is, just now perhaps, the dullest of any important interest; but we were informed to-day by one of the leading builders that there is reason
12 Ac	to anticipate that important contracts will be given out at an early date. In the mean- time there are on the Delaware five large iron steamships nearly completed, four
	large ferry-boats and one river steamer for South America just given out, besides a
	way of repairs, &c. The consumption of Iron has therefore largely increased, and much anxiety is felt in regard to values, a consideration of which will be found under
	the various headings.

Pig Iron-The firmness noted in our last report seems to be further confirmed, and we feel safe in saying that, taking the average transactions of the past week as a basis, Byrne Joseph & Co.
Tin plates, bxs., 1213
Hopkins E. T.
Tin plates, bxs., 743
Lamarche H. an advance of 50 cents per ton has been realized, as compared with prices current during December. The transition has been of such a character as to be barely perceptiof such a character as to be barely percepti-ble, but in each succeeding transaction the seller seems to have gained a fraction, until the current price of \$17 for No. 1 Foundry and \$15 for Gray Forge (with occa-sional concessions from those figures, have been changed to \$17.50, and \$15.50 as inside prices. The market appears to be entirely relieved from the pres-sure to realize, noted during the past sure to realize, noted during the past two years. Nearly all outside lots have past two years. Nearly all outside lots nave been cleaned up, while some of the most needy sellers by insolvency have been comneedy sellers by insolvency have been com-pelled to stop production, and are now out of the market entirely. The condition of the trade may therefore be considered en-tirely satisfactory. Stocks have been worked down to a very low point; con-sumption is steadily increasing, and, so far sumption is steadily increasing, and, so far as we can learn, all the companies are now in a condition to insist upon something like remunerative prices. During the past year buyers appeared to have absolute control of the market; they could almost dictate their own prices and their own terms, with the results of bankruntey to some producers. results of bankruptcy to some producers, and the gradual absorption of all such lots as could be secured, at prices known to be below cost of production. It is a new experience to buyers, to place their orders as a favor, as they now have to; and for the first time in our experience within three years, sellers are disposed to inquire if the applicant is entitled to consideration by reaof previous connection. As a rule regular customers can place their orde about last week's prices, providing deliveries are not too extended; others would probably have to pay a slight advance. Medium quotations of last week are now incidented and the convidence and the convidence is generally and the convenience and the convenience. Medium quotations of last week are now inside rates, and the outside figure is generally asked for deliveries after May. Gray Forge is very scarce. Good No. 1 Foundry Irons are also in limited supply, while No. 2 is somewhat pressed for sale, as compared with other descriptions. The demand has been quite active during the week but been quite active during the week, but owing to the caution of sellers, transactions have not been more than a fair average. The future, nevertheless, is one of uncertainty; and while there are many reasons for expecting higher prices, there are others of a character which seem to discourage very sanguine anticipations in this direcvery sangume anticipations in this three-tion. Some profess to think the present movement is merely a "spurt," to be fol-lowed by a reaction such as the trade have become accustomed to of late years. The mot weighty argument, however, seems to be at, if prices advance, say from £1 to \$2 per ton, Pig Iron can be shipped from England so as to compete with the American product. It is, indeed, thought by some that a very slight decline in the English market will lead to shipments, especially to roints remote from the producing districts market will lead to shipments, especially to points remote from the producing districts—say New England ports. The large amount of tonnage employed in carrying our exports renders it certain that West-bound freights will be taken very low; hence the otherwise favorable prospects for an advance may be considerably modified. There are other questions of similar importance which seem likely to prevent much higher prices being realized; but in the meantime present figures are regarded as perfectly safe. We quote No. 1 Foundry, \$17.50 @ \$18; No. 2, \$16; Gray Forge, \$15.50 @ \$17. Blooms.—Steady and fairly active at for-

Blooms.—Steady and fairly active at former prices, viz.: Blooms (2464 b), \$38 @ \$39; Northern Ore Blooms (2240 b). \$33 @ \$37; best quality Charcoal Billets (2240 b), for wire and steel purposes, \$58 @ \$60; Bars do., \$62.50 @ \$65; Sheet Iron Blooms, cornered (2464 b), \$53 @ \$55; Coldblast Charcoal Plate Blooms, \$50 @ \$53; run-out Anthracite, \$45 @ \$47.50. run-out Anthracite, \$45 @ \$47.50.

Muck Bar.—There is an active demand, and large lots could be placed at from \$30 @ \$31. We hear of a sale of 400 tons at \$31, Philadelphia delivery; but as a rule \$32 @ \$33 is asked.

Structural Iron.—There is nothing new Structural fron.—Inere is nothing new to report, and no orders of special impor-tance are now on the market. There is a tance are now on the market. There is a fair demand for small lots, however, and as the large mills have their full capacity engaged for some time to come, prices are held steady, with a tendency toward higher prices. We quote same as last week: Angles, 2.1\$\psi\$ @ 2.3\$\psi\$; Tees, 2.3\$\psi\$ @ 2.4\$\psi\$; Bams and Channels, 2.5\$\psi\$ @ 2.7\$\psi\$, according to the content of the c ing to specification.

Plate and Tank Iron.—There is a g demand for Tank Iron, but not more than an average business doing in other descrip-tions. There is no change in prices, but The general condition of business continues to show signs of a healthy reaction, and in nearly all the leading manufacturing establishments there is a considerable amount of work going on. The activity is more widely distributed than we have seen during the past three years, and it is not at all unusual to find large establishments. There are very few mills having orders on their books of any amount, but it is hoped that havings overtime while nearly all are or working overtime, while nearly all are on full time. These remarks apply to the Iron interests in all departments, with but one tor two slight exceptions. The Baldwin Locomotive Works are employing 1600 men on Tank Iron, 2.3\$\psi\$ @ 2.5\$\psi\$; C. No. 1, 2.4\$\psi\$ @ 2.6\$\psi\$; Shell Iron, 2.75\$\psi\$ @ 2.9\$\psi\$; Flange Iron, 3.7\$\psi\$ @ 4\$\psi\$; Solid Firebox, 4.85\$\psi\$ @ 5\$\psi\$, and Best Bloom, 5.5\$\psi\$

Sheet Iron.—The firmness noted in our Sheet 1701.—The firmness noted in our last is fully maintained, and although some good-sized orders have been taken at the prices current a week ago, others have been refused, and in still other cases an advance of \$1 to \$2 per ton has been obtained. Jobbers seem anxious to place their orders, but manufacturers are not william to actor, but bers seem anxious to place their orders, but manufacturers are not willing to enter into large contracts, unless at higher prices, which in the meantime rather retards busi-ness. The outlook for thin sheets is con-sidered quite encouraging, and a decided advance in prices only a question of time. We quote same as last week, but these We quoto same as last week, but these prices are now subject to change at any moment. Common Sheet, No. 20 to 23, 2.9¢ @ 3¢; No. 24 to 26, 3¢ @ 3.1¢; No. 27 to 28, 3.2¢ @ 3.3¢; Best Refined Sheet, No. 25 to 28, 3.3¢ @ 3.4¢; No. 22 to 24, 3.2¢ @ 3.3¢; No. 16 to 21, 3.1¢ @ 3.2¢; Best Bloom Sheets, No. 25 to 28, 5.2¢ @ 5.3¢; No. 22 to 24, 5.1¢; No. 16 to 21, 4.8¢ @ 4.9¢; Refined Plates or Blue Annealed, 5-16 to 16, 2.4¢ @ 2.5¢; American, R. G., 5-16 to 16, 3¢ @ 3.1¢; Best Bloom, 5-16 to 16, 4.9¢ @ 5¢; A Patent Planished, 10½¢; B Patent Planished, 9½¢; Best Bloom Galvanized, 45 % discount; second quality, 55%; extra discounts for large lots.

Bar Iron.—The market is firm, although

Bar Iron.-The market is firm, although Bar 170n.—The market is firm, although prices are very irregular, and in some instances are quoted as low as ever. There can be no doubt that parties who purchase, as many have done during the week at 1.6¢ @ 1.75¢, are getting an article made specially to suit the price. Manufacturers of the best brands will not sell below 1.9¢ and they claim there is no money in it at and they claim there is no money in it at that price, so that those who are getting Bars at \$5 @ \$6 per ton less money, are said to be getting an article which costs just so much less to make. We understand that some large orders have been placed during some large orders have been placed during the week, a great portion however being at the low prices above named. The demand for car-building, agricultural im-plements, &c., is very active, while many of the large machinery establishments are also using a larger amount of Bars than for a long time past. Many of the country mills seem to have found a market nearer home, and but little has been heard of them in the cities during the past few weeks; and in the cities during the past few weeks; and it may be fairly asserted that the demand for Bars seems to be larger and more widely distributed than during the past 12 months. Some of the city mills have declined orders at 1.9¢, unless for deliveries during March and April; for anything beyond that time, sellers prefer taking the risk of the market. We quote the market firm as follows: 1.5¢ @ 1.6¢ for Common; 1.7¢ @ 1.8¢ for Good Medium; and 1.9¢ for Best Refund

Steel Rails-There is still an active in-Steel Rails—There is still an active inquiry, but the amount of business closed during the week has not been important. The mills have taken about as many orders as they care for, and they are not offering any large lots, unless price and delivery are entirely in accordance with their requirements. Lots of too to vece tons was here. ments. Lots of 500 to 1000 tons may be given to regular customers at from \$42 @ \$44, according to location of mill, but no outside business is sought for at present. We understand that there are contracts on hand already which would employ the ca-pacity of all the mills up to midsummer. It is not surprising, therefore, that there is no urgency to enter into additional engage-ments. It should be stated, however, that, although there is nearly six months' work on hand, many of the deliveries extend far beyond that time, so that orders may be taken from time to time to fill in as re-

Iron Rails .- There is nothing whatever to report, beyond the usual transactions in small lots at about the prices of last week. There is some inquiry as usual, but nothing has transpired to change the condition of the market as recently reported. We quote \$32.50 @ \$35 at mills, on a cash basis, as a fair average quotation.

Old Rails.—The market continues in the same unsettled condition as reported during same unsettled condition as reported during the past month or more, but prices are not essentially changed. The amount of business doing on the spot is very trifling, as there are no Old Rails here, and it is not likely they would be sought for either, unless at slightly lower prices than named. Sales of small lots have been made during the week at \$20.50 @ \$21. which may be regarded as a fair value for Philadelphia delivery.

Spikes .- A fair demand and prices steady as follows: 5½ x 9-16, 2¢; ¼ x 4 and longer, 2.3¢; 7-16 x 4 and longer, 2.4¢; ¾ x 3¼ and longer, 2.7¢; ¾ x 3 and longer,

Old Car Wheels .- There are none here although they are in demand, and \$17 or more would probably be paid for good Seran Iron.-The market is kept have of

stock, and good lots easily command full prices as recently quoted. Cast, \$13.50 @ \$15; Wrought, \$20 @ \$22.50.

Nails.—The market is dull and prices a little unsettled, owing to the fact that one of our Philadelphia mills (James Rowland & Co.) have lately entered the market as free sellers. Their capacity for production is comparatively small, but they are anxious to introduce their product; hence the little flurry, which is probably of a temporary character. We quote \$2.05 @ \$2.10 as the usual rates for wholesale lots.

### PITTSBURGH.

Office of The Iron Age, 27 Fourth Avenue, 1 PITTABURGH, PA., Feb. 11, 1879.

While general business is not improving as rapidly as could be desired, it is picking up nevertheless, and the outlook continues favorable for a good, healthy spring trade. Our manufacturers, and merchants as well, are expecting to have a larger trade this coming spring than they had during the same time in 1878, and the indications are that their expectations will be realized. Stocks of Pittsburgh manufactures, both in first and second hands, are light, and an increased consumption is confidently looked for; and then, moreover, the fact that the time to come; they are down about as low

very lowest point (for some articles, has been increased within the past few months) will not be without its effect in stimulating the not be without its effect in stimulating the demand. As everything has been steadily shrinking in value for som? years, there has been no inducement on the part of the job ber to anticipate future wants. On the contrary, those who did so had reason to regret it, owing to the constant shrinking in values; and this led to the commonly termed "hand-to-mouth policy," which, for some years past, has been so persistently adhered to. Now, however, the situation in this important particular has changed; the cost of the raw articles out of which the leading manufactures are produced is, to use a comthe raw articles out of which the leading manufactures are produced is, to use a com-mon phrase, down to bed-rock. Some of them have been advanced very recently; and we think that jobbers need have no ap-prehension about anticipating future wants, present writing, are more likely to go up than down. Another encouraging feature is that business, in nearly all its varied branches, is in a better and more healthy condition than it has been for a number of years. While there is a continued sharp competition, there is not the same disposition to work for nothing, and those individuals or firms without capital or credit, and who had to sell their products at the best rates they could obtain, regardless of cost, have been pretty effectually wiped out; hence there is not the same any wiped out; hence there is not the same necessity now to slaughter goods that there has been, as nearly all the bogus and crippled firms, who were largely responsible for the unsatisfactory condition of affairs which has so long prevailed, have gone Pig Iron.-There has been but little

cost of production has been reduced to the

change in the situation since our last report, with the exception of an increasing business, which is still backward as compared with what it should be and usually is at this par-ticular time, as well as with what was ex-pected at the commencement of the year. pected at the commencement of the year.
In view of the improved demand, as well as
the probable increased cost of production,
a decidedly firm feeling is being developed;
and while no very decided advance is looked and while no very decided advance is looked for, sellers generally are pretty confident of being able soon to secure 50¢ to \$1 \$\text{P}\$ to non top of ruling rates, particularly for standard brands, which are in light supply and held with considerable tenacity. As stated in our last report, some furnaces now in blast will be compelled to blow out soon if prices do not improve, as they cannot stand it to work at a less all the block. not stand it to work at a loss all the time. True, better prices were expected a year ago without being realized, but things are in better shape now than they were then, and the situation in many ways is more favorable for the realization of the hopes en-tertained. Stocks in the West, both in first tertained. Stocks in the West, both in first and second hands, are comparatively light, and second hands, are comparatively light, as are also the production and the consumption. This year is expected to be considerably in excess of the one so recently closed. Bituminous Coal Smelted Irons, \$18 @ \$20, 4 mos., for Foundry, and \$17.50 @ \$19.50 for Mill, the outside figure for all-one Red-short. Coke Irons, \$16, cash, @ \$16.50, 4 mos., for Mill. Eastern Cold-blast Charcoal, \$26 @ \$30, 4 mos.; ditto Warm Blast, \$22 @ \$26. Bessemer Pig continues quiet, and in the absence of sales we continue to quote at \$20, 4 mos. Charcoal tinue to quote at \$20, 4 mos. Charcoal Blooms, \$50 @ \$54, 4 mos.

Manufactured Iron.-The demand, although hardly up to what it was expected it would be at this particular time, is increasing; some of the mills are quite busy, and outlook is considered favorable good spring and summer trade. peatedly stated in these reports, there is not much apprehension about a scarcity of or-ders, as the consumption this year, it is believed, will exceed that of 1878, neved, will exceed that of 1878, but it seems almost impossible to get prices on a paying basis. What is wanted by our manufacturers more than anything else is a margin for profit, and this, it is hoped, they will soon be able to obtain. While, as stated in our last report, steel has been making in-roads upon iron for some years past, taking its place for many purposes, it is also true is also true Iron buildthat iron is supplanting wood. ings, bridges, fences, &c., have become very common, its cheapness having brought it into more general use than ever before, and this leads to the belief that there will be an Dacota, as well as the New States of Nevada and Nebraska; not only for Iron, but Pittsburgh manufactures generally, and then it is reasonably certain that the older Western and Northwestern States will or-der more liberally this spring than for some

Nails.—There has been nothing particularly new developed during the past week, but there is an increasing inquiry, notwitistanding. Little, if any, effort is being made to solicit orders, but the prospect, we are sorry to say, for an improvement in price is not as favorable as it might be. While, so far as we can learn, the advance of the state of the same of the While, so far as we can learn, the advance established by the association some time ago is maintained, it affords little or no margin for profit, and some makers still entertain hopes that once orders commence to come forward more freely, a further ad-vance can and will be established. We continue to quote at \$2.05, 60 days, 2 % off for cash. A regular meeting of the Western Association takes place here to-morrow, and if anything important is developed, The Iron Age will, as usual, be duly advised by tele-

Steel.-The general position of the Steel Steel.—The general position of the Steel business here in Pittsburgh remains much the same as noted a week ago. Some of our manufacturers report that business is not panning out thus far as favorably as they had expected and hoped for, but the demand will no doubt improve within the next few weeks. The fact that the capacity is being increased is discouraging to those already in the business. but as the consumption is in the business; but as the consumption is steadily increasing every year, we incline to the opinion that there will be sufficient business for all. No recent change in prices, nor is it likely that there will be for some will be sufficient

13, 1879.

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Ralls.—The market for Steel Rails continues firm, and as the mills, not only here, but at all points in the West, appear to be sold considerably ahead of their production, there is no disposition to make concessions in order to effect sales; indeed, there is a disposition to demand an advance. We continue to quote at \$43.50 @ \$44, cash, delivered free on cars in Pittsburgh. Steel Rail Ends, \$28 @ \$32, according to length; Steel Billets, \$44 @ \$47, all cash at works. Old Iron Rails are still quoted at \$23.50 @ \$23.75.

Scrap—There is a fair and increasing de-

are still quoted at \$23.50 @ \$23.75.

Scrap—There is a fair and increasing demand, and prices, if anything, are firmer but unchanged. No. 1 Wrought Scrap, \$22. net; Old Car Wheels, \$10 @ \$20, gross; Car Springs, \$30 @ \$31, net; Car Axles, \$27 @ \$28; Wrought Turnings, \$15. Cast Borings, \$11 @ \$11.50, gross; Boiler Scrap, \$22, net.

Window Glass .- Business continues quiet, window Glass.—Business continues quiet, as it usually is at this particular time, but it is probable that there will be some inquiry within the next week or two. No change in discounts, which are still quotable 75 @ 75 & 10 for car-load lots.

75 & 10 for car-load lots.

Petroleum.—The market for this important staple continues dull and depressed, although prices are being maintained better than was generally expected at the close of the year. The production continues large, exceeding 40,000 bbls. per day, while the consumption is but little more than one-half, and the consequence is a steady accumulation of stock, and while this continues there can be no improvement in prices. can be no improvement in prices.

### CHATTANOOGA.

Office of The Iron Age, Market and 8th Sts., & CHATTANOOGA, Feb. 8, 1879.

Business is fair for the season. Almost every line of trade seems to have its hands full. The Iron market for crude metals full. The Iron market for crude metals steadily improves. Holders are firm in their views. There is no pressure to realize, and plenty of faith that prices will improve. There will be better trade this spring than last, and more business the coming summer than there was last summer. The weather during the week has been wet, raw and disagreeable, ending brightly to-day.

and disagreeable, ending brightly to-day.

Pig Iron.—The trade is steady. We note an advance in Forge grades and in lower grades of Foundry. Coke Irons—No. I Foundry, \$17.50 @ \$18; No. 2, \$16 @ \$17; Gray Forge, \$14 @ \$14.50; White and Mottled, \$12 @ \$12.50. Hot-Blast Charcoal—No. I Foundry, extra, \$20 @ \$21; ditto, \$18 @ \$20; No. 2 Foundry, \$16 @ \$18; Gray Forge, \$15 @ \$17; White and Mottled, \$15. Cold Blast Charcoal—Car Wheel Metal, \$22.50 @ \$27.50; do., Extra Standard, \$24 @ \$20.50; Forge, \$17 @ \$22. Forge, \$17 @ \$22.

Muck Bar—\$27 @ \$34. Old Rails, \$18 @ \$18.50. Old Car-wheels, \$18. Wrought Scrap, \$17 @ \$19.

Furnace Coke at \$2 per ton, free on cars at Chattanooga, or \$1.50 per ton at the works.

Coal.—Trade is fair, with a downward tendency. Best Household Coals are not quotable above 12¢, delivered. Run of mine to manufacturers, \$1.50 @ \$1.75 per ton. The tendency of Coal of all grades is downward. We shall probably quote at \$1.30 @ \$1.40, run of mine, free on cars in Chattanooga, before the coming summer closes.

s they can go, and no immediate advance, as they can go, and no immediate advance, as they can go, and no immediate advances, as they can go, and no immediate advances, and the state of the continues to be a fair degree of those where the continues to be a fair degree of the continues the contin Straits, 15¢ @ 15¼¢; Banca, 19¢; Refined English, 15¢, gold. We quote: Plate: Charcoal, I. C., \$6.50 @ \$6.75; Coke, \$5.50 \$5.75; and Charcoal Terne, \$6 @ \$7.50.

—Commercial Bulletin.

### LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of Feb. 10 write us as follows: We have no important change to note. Prices are very firm, and some furnaces have advanced (Oke—The demand has fallen off somewhat recently, but dealers generally still have about all they can do, and prices are well maintained, ranging from \$1.50 @ \$1.25 per ton, delivered free on cars at ovens.

This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 per ton since January 1. This advance, however, is not generally still the price of their iron \$1 p

Toronto more .		
FOUNDRY IRONS,		
No. 1 Hanging Rock, Charcoal	21.00 @	22.00
No. 2	19.00 @	20.00
No. z Southern, Charcoal	18.00 3	x8.50
No. 2 " " " No. 1 Hanging Rock, Stonecoal and	16.50 @	17.00
Coke	19.00 @	20.00
Coke	18.00 @	18.50
No. 1 Southern, Stonecoal and Coke	18.50 @	
No. a "	17.50 00	18.00
"American Scotch"	18.00 @	10,00
Silver Gray	16,00 @	17.00
MILL IRONS.		

No. 1 Charcoal, Cold-short and Neut'l. 16.50 @ 17.00
No. 1 Stonecoal and Coke, Cold-short
and Neutral. 16.50 @ 17.00
No. 2 Stonecoal and Coke, Cold-short
and Neutral. 15.50 @ 16.00
No. 1 Missouri and Indiana Red-short. 20.00 @ 21.00
White and Mottled, Cold-short and
Neutral. 14.50 @ 15.00
CAR WHEEL AND MALLEABLE IRONS.

W. B. BELKNAP & Co., Iron and Steel merchants, No. 113 and 115 West Main street, under date of Feb. 10, report that the past week has brought no change in the market for Manufactured Iron, the demand continuing fairly good and prices firm. The production and consumption of iron in the production and consumption of iron in the Ohio Valley seem at present very satisfac-torily adjusted to each other, the mills in torily adjusted to each other, the mills in operation being just about equal to the demand, which is of the steadiest and most unspassmodic character. Prices are almost uniform, and while not ruinously low, are kept at so moderate a figure as to stimulate no competition to break them down. The aspect of general trade in this quarter cannot be said to be very promising. Small crops and low prices for tobacco, wheat and pork have made Kentucky farmers feel very poor, and in the interior of both Kentucky and Tennessee there is less money in circulation than for years past.

### CINCINNATI.

Muck Bar—\$27 @ \$34. Old Rails, \$18 & \$18. Wrought \$\$Crap, \$17 @ \$19. Ores.—Brown Hematite, 50 to 56 %; per ton, \$1.75 @ \$2.25. Red Fossiliferous, 50 to 56 %; per ton, \$1.70 @ \$1.90. The above prices for ores delivered in Chattanoga on cars, or on the wharf from flat boats.

Nails.—The demand is beyond the ability of the mills to fill. Prices are very firm, with good prospects of an advance. We quote at \$2.25 rates, usual discount on job lots.

Man: factured Iron.—The trade continues good. Prices are firm. The mills are all pushed with orders, and none of them have any stock on hand. We quote Bar at \$2; Railroad Spikes, \$2.50; Light Rail, \$2.25; Track Bolts, \$3; Trestle Bolts, \$4. Coke.—Washed Foundry, 11¢ to 15¢ per bushel, free on cars in Chattanoga. Furnace Coke in full supply at \$2 @ \$2.50 per ton. We hear of offers of a good article of Furnace Coke at \$2 per ton, free on cars at Chattanoga of \$2 to per ton at the works. Messrs. E. L. HARPER & Co., under date of

Hanging Rock C. C., No I	\$31.00 @
C. C., No. 2	19.00 @ 19.50
Hanging Rock Coke and S. C., No. 1	17.00 @ 19.00
8. C., No. 2.,	15.co @ 17.00
Virginia Coke, No. 1	18.50 @ 19.00
44 No. 2	17.50 @ 18.00
Shawnee Am. Scotch, No. r	20.00 @
" S. C., No. 2	16.50 @ 17.53
Hocking Valley S. C., No. 1	18.00 @ 19.00
8, C., No. 2	16.00 @ 17.00
FORGE TRONS.	
Hanging Rock, No. 1 C. C	18.50 @ 10.00
Hanging Rock, No r Coke	16.50 @ 17.90
Longdale, No. 1 Coke	17.50 @
Ala, and Tenn, No. r C. C.	17.50 @
Red-short, No. 1 Coke	
Cold-short, No. 1	15.50 ( 16.00
Old Rails, primecash,	
	-
CAR WHEEL AND MALLEABLE	G.

Refined Bar Iron, 1 to 6 wide by 3/4					
to z thick	D	1.85	@	3	¢
Refined Bar Iron, 1 to 41/2 wide by		-			
11/2 to 2 thick	56	1.85	0	2	9
Refined Sar Iron, 1/4 to 2, Round					
and Square	65	1.85			
Hoop iron, 11/2 wide and upward	44	236			
Band Iron, from 11/4 to 4 in. wide	44	234	@	25	é¢
Horse-shoe Iron	6.6	3.	0	33	20
Norway Nail Rods	66	43/4	0	534	10
Black Diamond Cast Steel, Flats,					
Squares and Octagon, ordinary					
sizes	6.5	13	0	14	#
Machinery Steel	65	8		10	
Cast Spring Steel	6.9	6		63	
Homogeneous Steel Plate	66	7	6		
Common Horse Nails	6.6	X2	60	16	0

Iron	\$27.00 @ 30.00
*********	19.00 @ 20.00
***** *****	18.00 @ 19.00
ita	10.00 ( 17.00
	13.00 (B 14.00
	43.00 @ 45.00
	alte

	No - Tonnesse and 11-1
_	No. r Tennesse and Alabama 20.00 @ 21.00
	No. 1 Missouri
:	COKE
)	No. 1 Hanging Rock\$21.00 @ 22.00
	NO. 2 " "
•	No. 1 Tenn., Ala. and Ga 20.00 @ 21.00
	No. 2 " " " " " " " " " " " " " " " " " "
	19.00 @ 20.00
	FORGE IRON.
	No. 1 Tenn., Ala. and Ga\$17.00 @ 17.50
,	No. 1 Missouri
9	COLD-BLAST CAR WHEEL,
•	Hanging Rock
ı	10111., Altt. and Ut
	Missouri 28.00 @ 30.00
-	
	BILVER GRAY.
ı	Hanging Rock\$17.00 @ 18.00
	Tenn., Ala. and Ga 17.00 @ 18.00
	Old Rails, gross
	Old Car Wheels, gross 20.00 @ 21.00

are dun.		
American Scotch Pig Iron	21.50 @	22,50
Anthracite, No. 1	10.00 @	20,00
" No. 2	18,00 @	
14 No. 3	17.00 @	18.00
" Mottled	14.50 @	
Coke, No. 1	10.00 @	20,00
" No. 2	18.00 @	
" No. 3	16.50 @	
Va. Cold-blast Charcoal, Cold-short	20,00 @	
Va. " Neutral	27,00 @	
Va. Warm-blast " Cold-short	18.00 @	21.00
Va. " Red-short	17.00 @	
Old Rails	17.50 @	18,50
Wrought Scrap No. 1	17.00 (4)	
Cast " (machinery)	15.00 @	
Richmond Refined Bar Iron	2C. (0)	
Horse Shoes per keg	@	4.00
	@	5.00
Old Dominion Nails, Standard Size, &		
kor	A	

by sail.

Freights to New York, \$1.60 per ton of 2240 Ds, by sail.

## Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

LONDON, ENG., January 27, 1879. WE TALK OF TARIFFS

we talk of tariffs
more than anything else just now—indeed,
we have rather more material of this kind
than we can use up. Not only in Europe,
but in almost every other corner of the globe
there appears to be a sort of tariff mania.
Nations evidently like to participate in the
general movement in some sort of way, even
if the changes made are but nominal and
patty. We are a good deal interested in the possible doings of the Canadians, but if all we hear be true the new duties there will scarcely prove prohibitory to English manu-facturers of iron, steel and hardwares. We

facturers of iron, steel and hardwares. We have almost given over Europe as a bad job—France, Italy, Spain, Russia, Germany and Austria having apparently made up their minds that they will have their protectionism served up hot and strong. There are those here who profess to believe that Bismarck's new tariff will not be carried through, but, from all our past experience of that man of blood and iron, he will of a certainty overcome all obstacles and get the Reichsrath to further his schemes.

to preach undiluted free trade all round; to fence with reciprocity; and, for the most part, to express the belief that the "good time" will come again, and with it renewed manifestations of the immense commercial superiority of Old England. Mr. Forster made a capital free trade and commercial speech last week at Bradford on these lines, and to-day his lead has been respectfully followed at Sheffield by Mr. Mundella, one made a capital free trade and commercial speech last week at Bradford on these lines, and to-day his lead has been respectfully followed at Sheffield by Mr. Mundella, one of the members for that town. The Iron-monger and other journals express dissatisfaction with the lack of appreciativeness shown by Mr. Forster as to the progress of foreign competition; but as yet there is a great majority against any return to protection.

not safe. Lamp No. 2 contained a sample of oil, said to be inferior, selected by S. Banner & Co. This had a thick wick. It Banner & Co. This had a thick wick. It had been burning for two hours, and showed a flame that was perfect. Mr. Lockwood now put the burner and wick of lamp No. 2 on to container of No. 1, without, of course, any additional oil, and it continued to burn well, thus proving that a thin wick will burn good oil, while a good wick will burn any oil. After some remarks from the gentlemen present, the following resolutions were come to: "That this meeting, having received the explanation of Mr. Lockwood, is of opinion that the burning of Bradford and allied petroleum oils is materially improved by the adoption of looser and thicker wicks of good material. 2. That this meeting desires to impress most strongly upon the Standard Oil Company the absolute necessity of maintaining the highest possible quality both of ordinary and of water-white oils

of maintaining the highest possible quality both of ordinary and of water-white oils lahipped to the United Kingdom."

At the London meeting there was a very large attendance, and the various branches of the subject were gone into most carefully and thoroughly. The secretary of the petro leum association read a

### IN SCOTLAND

per ton. The tendency of Coal of all grades is downward. We shall probably of Coal which, No. 1. 004 short, No. 1. 004 s

have been "receiving" Mr. F. W. Lockwood (of Lockwood Bros. & Holly, oil inspectors appointed by the New York, Produce Exchange) in meeting assembled for the discussion of the alleged inferiority of certain kinds of oil recently shipped from your side to this country, at Liverpool. Mr. S. Banner occupied the chair, and Mr. Lockwood said his attention had been called, some little time ago, to the very inferior class of wick lately come into use. It had been going from bad to worse. Most of that now in use in England was of German make. It had been microscopically examined and found to be made of cotton refuse, or the commonest and cheapest short staple not be much surprised to hear of other complications shortly, for I am told that the late James Morrison (who founded Ferry Hill and several other concerns) had lost £250,000 in them prior to his death early last year. At several of the Cleveland works experiments are being made with a view to ascertaining the practicability of making steel from the Cleveland ores. Bolckows and Mr. Lowthian Bell are each working hard in this direction.

### THE QUARTERLY IVORY SALES

THE QUARTERLY IVORY SALES
have been in progress during the past week,
about 200 tons being in stock. The general
result has been a drop in prices of £5 %
cwt. on Cape and Egyptian, and £2 @ £3 on
East Indian. West coast of Africa fetched
from £23. Io/ to £49. I5/ % cwt., according
to sizes, &c.; Zanzibar and Aden from
about £35 to £70, and Cape from £20 to
£43. The principal buyers have been Messrs.
Peat, Green, Brooks, West, Clark, Eysson
and Grays. A quantity of the 64 tons on
sale by Messrs. Hale was withdrawn, owing
to the lowness of prices to the lowness of prices

### AT SHEFFIELD

the distress is being manfully met, and to a great extent successfully battled with, but the severity of the weather and the non-revival of business, render it necessary that there should be no relaxation of the relief there should be no relaxation of the relief committees' efforts. At the larger iron and steel works the amount of work in hand is small, and current orders are remarkable for their paucity. Only the Bessemor establishments are at all respectably engaged, and there is ample reaton for knowing that rail contracts are being run off at exceedingly bare prices. At one of these concerns the rumored changes of the partners have been settled amicably—at all events, I have no information to the contrary. The castell houses are very dull, but I am told that there is a moderate stroke doing in cutlery and tools. In the sheep-shear branch the upsetting of Burgon & Ball's patent (for stamping shears out of a piece of sheet steel) has already resulted in a reduction of 5 per cent. in prices by one firm, and will no doubt tend to the greater development of the manufacture of these articles, which sell very largely in South America, the Cape and our larger Antipodean colonies.

### TRADE WITH THE UNITED STATES

from Birmingham and Wolverhampton has been attended with different results. Bir-mingham increased its connection to the facturers of iron, steel and hardwares. We have almost given over Europe as a bad job—France, Italy, Spain, Russia, Germany and Austria having apparently made up their minds that they will have their protectionism served up hot and strong. There are those here who profess to believe that Bismarck's new tariff will not be carried through, but, from all our past experience of that man of blood and iron, he will of a certainty overcome all obstacles and get the Reichsrath to further his schemes.

Our public speakers

in the meantime continue to hammer away at the crass stupidity of the protectionists; to preach undiluted free trade all round; to fence with reciprocity; and, for the most carefully and throughly. The secretary of the petro hand throughly. The secretary of the petro hand throughly. The secretary of the petro leum association read a vises, buttons, chemicals, implements and steel pens. Wolverhampton, on the other hand, fell off £6905, the chief articlear wicks in general use here, and his conclusion seemed to be that the deficient burning and illuminating powers of the oil arose from indifferent wicks and burnors; but, he said, the fact remains that some of the oils valved in the fact remains that some of the oils valved in the general trades to per ton, and certain iron with fact remains that some of the oils wared in the general trades to per ton, and certain iron with fact remains that the vold seem to be essential that, in their own interests, the Standard Oll Company should take all practicable and vises, buttons, chemicals, implements and steel pens. Wolverhampton, on the other hand, fell off £6905, the chief articlear sent thence to you being tim plates, nail rods and strip iron. There is no particular to the fact remains that sent the each pens. Wolverhampton, on the other hand, fell off £6905, the chief articlear sent thence to you being tim plates and tises, buttons, extent of about £20,000, chiefly in anvils

is reported to-day, the defaulter being William Thomas Cooke, lately carrying on business as Thomas Cooke & Co., and owing about £10,000.

### THE AFRICAN TRADING COMPANY,

or rather that which is proposed to be such, has sustained the defection of Mr. H. M. Stanley, whose amour propre seems to have been wounded by some of the speeches at the Manchester meeting, and who therefore says he has "committed himself to another undertaking."

tors ingots. Tin has also been quiet, opening at £59.15/ for fine foreign, and £63 to £63.10/ for English ingots. These rates have been shaded to the extent of 10/@ 15/ during the week. There have been imported 2331 slabs from Penang in the Orestes. Tin Plates are still in good orestes. Tin Plates are still in good request, and makers are quite firm in their quotations, which range from 15/ upward. The United States market is continuing its previously reported large purchases. With France a fair business is being done but native competition there is ing done, but native competition there fast assuming tangible proportions. Lead is unchanged, with slow sales at £14 @ £15 for English pig, and £13. 17/6 for soft Spanish without lead. Sheet, pipe, &c., qualities without lead. Sheet, pipe, &c., qualities are similarly weak. Speller is nominally £16. 5/ for ordinary English; Quicksilver, £6. 5/ the bottle; and Antimony, £47 for French star.

The official report of the London Metal Exchange was: "Copper.—Quiet; G. O. B. Chili bars, £56. 10/; Wallarco, £66; Burra, £64; English tough, £61. 10/ @ £62. 10/; best selected, £62. 10/ @ £63, 10/; strong sheets, £67. Tin.—Unchanged; fine foreign, £59. 10/ @ £59. 15/, spot; English ingots, £63. Iron.—Scotch pigs, 42/5, cash. Lead.—Dull; English pig, £13. 17/6 @ £14. 2/6; soft Spanish, without silver, £13. 15/.
Spelter, £16. 5/ for ordinary brands. Zinc.

No quotations. Quicksilver, £6. 5/. Antimony, £47."

### FOREIGN.

### FRANCE. Moniteur des Interets Materie's.)

Paris, Jan. 22, 1879.—Metals.—Business in metals is picking up slowly. Copper.—The market has been quiet, with a fresh decline of \*franc\* in Chili Bars and 2.50 francs in Ingots and Best Selected. We quote: Chili Bars, 156.50 francs the 100 kilos.; Common ditto, 132.50; Ingots and Slabs, 155; Best Selected, 166; Coroccoro Ore, 166; Sheathing, 186; and Yellow Metal ditto, 1.70 Copper is nominal at Havre, where they quote first brands Chili Bars 152.50; good current ditto, 150.50; and Lota and Urmeneta, 147.50, Paris conditions. This shows a decline on the whole line. Marseilles reports a weak market and a 5-franc decline on Refined Ingots. They quote small Refined Ingots 180; Sheet Copper, 180; Sheathing, 175; Tim.—Quite a breakdown has occurred here. We quote: Banca, 170 francs the 100 kilos; Billiton, 167.50; Sheathown has occurred here. We quote: Banca, 170 francs the 100 kilos; Billiton, 167.50; Shraits, 161.50; Australian, 161.50; and English, at Havre or Rouen, 162.50. The foregoing quotations show a decline for the week of 7.50 francs in Banca, 55 francs in Billiton, 350 in Straits and Australian and 4.25 in English. Marseilles has given way 2 francs in English Tin and 1 franc in other corts. They quote: Banca, 165; Straits, 160; French, 170; and English, 167. Lead is weak and has yielded 250. on all sorts. We quote here, all kinds, 37.25 francs the 100 kilos; at Havre, 36.75; Manufactures, 50. Havre has dropped 500. Øt franc. They quote First Fusion Soft Spanish, 37.502.35. Marseilles is also upheld with some difficulty. Spanish has been sold as low as 34 francs. They quote First Fusion Soft Spanish, 37.502.35. Marseilles is also upheld with some difficulty. Spanish has been sold as low as 34 francs. They quote Silesian, 43.00.4. Marseilles is 1.50 francs lower. They quote Vielle Montagne Sheet Zinc, 60; Royal Asturian, 6c, and Biache St. Waast, 28. Havve quotes Silesian, 43.00.4. Marseilles is 1.50 francs lower. They quote Vielle Montagne Sheet Zinc, 60; Royal Asturian, 6c, and Biache St. Waast, 28. Hav quantities in this region, and in order to similarle sales, makers are accepting very reasonable figures for them. There is little doing in the Rhone and Loire, and people there are getting restless under this prolonged duliness. The shares of works in this region are offering and selling at low rates. In the Tarn district there is a rumor that the St. Albans works and mines will resume work.

### (Revue Universelle.)

(Revue Universelle.)

BRUSSELS, Jan. 22, 1870.—Iron.—The outlook in this country, instead of improving, is getting worse, and after four rolling mills have stopped operations in the Charleroi Basin, and two blast furnaces have been blown out in the same region, alluded to in previous reports, the strikes are now upon us. At the Esperance Works 200 workmen have refused to submit to a reduction of wages, and have struck work in consequence. At the Providence forges it is proposed that wages be lowered 18 per cent, but the workmen will subscribe to a 5 per cent, reduction only. Producers evidently have no choice but to reduce salaries. They have first cut down the output, subsequently They have first cut down the output, subsequently a great many works ceased operations, but all this has been of no avail, prices declining steadily and sales dwindling down to a mere trifle, despite the low rates ruling. This places the small works in a poor plight; the financially powerful and large concerns come in for a large share in the government adjudications by being content to work without profit, but the small concerns are left in the cold and struggle on against hope. Under these circumstances we shall be glad if the plan frequently hinted at by us of introducing more generally Iron sleepers should be adopted. The State railroads take the lead in this matter and will require 4600 tons thereof under adjudication by Feb. 12.

### GERMANY. (Borsenhalle.)

(Borsenhalle.)

Hamburg, Jan. 22, 1879.—Metals.—The first three weeks of the year have been remarkably quiet, due in a measure to economical questions now agitating commercial circles in Germany and much discussed among people in the metal line. Copper.—Very little has transpired and prices have undergone no further change here and Stettin, while Berlin quotes Mansfield, 50 @ 50.50 marks the 50 kilos, and English and Australian, 50 @ 61. 7m.—This metal has been quite weak. No decline has, however, taken place here and at Stettin, but Berlin quotes Banca, 59.50 @ 70, and English, 67 @ 67.50. Lead has been slightly looking up, and though not quotably higher here and at Stettin, Berlin has improved and quotes as follows: Tarnowitz, Hartz and Saxonian, 14.50 @ 14.75 marks the 50 kilos. Spelter.—Dealings in this metal are still restricted to comparatively small amounts, and we shall have to wait for another month ere much of a revival may be expected. Meanwhile prices, especially for desirable brands, remain steady on the basis of 16.75 @ 77.50 marks the 50 kilos and 16.75 @ 77.50 marks the 50 kilos at Berlin. No quotation has reached us from Breslau, where there is a total absence of business, and prices are nominal in consequence. No change can be reported either from this market or Stettin, and we repeat former quotations.

### HOLLAND. (Koch & Vlierboom.)

ROTTERDAM, Jan. 18, 1879.—The decline in this metal has made further progress. Banca has dropped from 37,50 guilders the 50 kilos. to 36,75, at which figure there continue to be sellers. Hardly anything transpires in Billiton, nominally

### (Schmidt, Kustermann & Co.)

(Schmidt, Kustermann & Co.)

PENANG, Dec. 14, 1878.—Tin has been negle the greater part of the fortnight, and prices declined rather precipitately from \$18.52 \( \frac{1}{2} \) pic \$18\$. Meanwhile more favorable advices dropped in from London, and exchange has come favorable to exporters, causing a more idemand toward the close and a rebound to \$18 ales for the fortnight sum up 7800 piculs, 680 which for Europe and the rest for China. Sin bazaar, 6000 piculs.

### CHINA.

### (Arnhold, Karberg & Co.)

(Arnhold, Karberg & Co.)

Carron, Dec. 20, 1878.—Coal continues, in spits of favorable statistics, to be neglected, and we have to report a decline of values for all qualities. Both dealers and consumers appear to be fairly supplied, and it is difficult to say how long they may be able to abstain from buying and thereby depress the market. The general opinion, based on the small supplies on the way, however, continues in favor of an early improvement. We quote English, \$3 @ \$8.25, and Australian, \$6.75 @ \$7.50.

### INDUSTRIAL ITEMS.

### MAINE.

Wood, Bishop & Co.'s stove foundry, in Bangor, has resumed work. NEW HAMPSHIRE.

It is understood that a company has be formed for the introduction of the Holly system of heating into Manchester. The stock, \$50,000, has nearly all been subscribed, and the company is preparing to begin oper ations at once.

### MASSACHUSETTS.

A number of hands were discharged from Smith & Wesson's shops at Springfield re-cently, and the force will be kept for the present at about 300. The principal reasons for the reduction are that some branches of the work are way ahead of others. The firm turn out now a total daily production

of 250 revolvers.

The Lowell Machine Shop has changed its running time from three-fourths to four-fifths time, by reason of an increase in busi-The foundry is running full time. CONNECTICUT.

The Howe Sewing Machine Company at Bridgeport, commenced running ten hours per day on Monday last. They have been running eight hours since the holidays. Sharps Rifle Company have recently re-ceived, through the Austrian Ambassador

at Washington, the great gold medal of the Austro-Hungarian empire, which was sent them by His Majesty the Emperor as a token of his high appreciation of the merits of samples of the Sharps company's pro-ductions, furnished to the Austrian Governof samples of the Sharps company's productions, furnished to the Austrian Government. The medal is of large size, of solid gold, and is very beautiful in design and execution and has considerable intrinsic

At the annual meeting of the Peck, Stow & Wilcox Company, held on Tuesday, the 28th ult., the old board of directors were elected with the exception of MacKenzie, vice L. O. Neal, deceased. The reports showed the financial affairs of the company to be in a very prosperous condition. A committee was appointed to take into consideration and report upon the best methods of protecting the property of the company against the risks by fires.

The Richmond Stove Company, of Nor-

wich, began January 1 to run on full time. This became necessary, as their orders were ahead of the supply. They now employ seventy hands, or nearly their full capacity.

NEW YORK. The Washburne Fluter, manufactured by P. E. Washburne, Buffalo, is the largest made, the roll being 2½ inches in diameter and 3 inches long. It is full nickel plated and polished, and has two heaters. Mr. Washburne has also special facilities for Washburne has also special facilities for making gray iron castings, and all kinds of plating in nickel, gold, silver and bronze; also every description of stove trimmings, brass finishing, patterns, models, hardware and light machinery. He reports an active, and increasing demand for fluting machines.

Messrs. E. & B. Holmes of Buffalo, manufactures of stays barvel and here.

facturers of stave, barrel and keg machinery, have rebuilt their works, which were destroyed by fire last year. Their present works consist of a building 45 by 152 feet, four stories high, with an addition of 35 by 60 feet. They have introduced the having cost \$6000. Their machinery is in successful operation all over the United States, and they have exported largely to

Europe.

It is said there is some prospect that the

It is said there is some prospect that the Niagara River Iron Company's furnace at Tonawanda will go in blast next summer.

Newton & Co., of Albany, have achieved an excellent reputation in the manufacture of fire-brick and stove linings, and now claim to furnish better stove linings and hards than area at no increase in secret. claim to furnish better stove linings and brick than ever, at no increase in cost. Stove linings are their great specialty, although brick are produced in large quantities. Their products are taken East and West, even in California, and are sent to Europe, Australia, the Sandwich Islands and other places abroad. Their transactions are generally for large quantities, foundries being principally supplied.

NEW JERSEY.

Bayonne promises speedily to become a arge manufacturing center for various inwater front, by Martin Kalbfleish's Sons, has been improved by a large outlay of capital, so that the manufacture of chemicals will commence there in a few week-leim cales will so that the manufacture of chemicals will commence there in a few weeks, in expecta-tion of a gradual transfer from the old loca-tion in Bushwick, L. I. The Standard Oil Works are also investing heavily in enlargements, and Chas. Pratt, whose refinery is at Hunter's Point, is reported to have recently purchased 15 or 20 acres at the same lo-cality. A merging of interests by the two parties last named is also spoken of.

### NEW JERSEY.

The rolling mill at Paterson has resumed perations. This mill, it will be rememoperations. bered, was destroyed by fire last year.

DELAWARE, Hugh E. Steele & Son, formerly of the

held at 36 guilders. It could, we believe, be bought at 36.75. The great duliness is due in part to the company's sale to come off Jan. s8, people prafering to await its result.

EAST INDIES.

(Schmidt, Kustermann & Co.) operation. They in about 10 days.

### PENNSYLVANIA.

The new year has brought to the Baldwin Works a good influx of orders. Among them are six narrow-gauge locomotives for the Baturite Railway, of Ceara, Brazil, 17 for the New York Elevated Railroad, and scattering orders from the Canadian Pacific, Missouri Pacific, Orogon, and California and Missouri Pacific, Oregon and California and Macon and Brunswick Railroads. The Pennsylvania Tack Works at Norris-

The Pennsylvania Tack Works at Norristown, were partially destroyed, shortly before midnight on Sunday, by an incendiary fire. A number of valuable tack machines were either ruined or badly damaged, and a large amount of packing material destroyed. The stock and building were insured for \$60,000.

\$60,000.
On Wednesday, the 29th ult., for the first time, the Phœnix Iron Company illuminated their machine shop with the electric light. They have one 6-light Brush machine now in, and expect to have a second machine in

operation shortly.

The Harrisburg Car Company having received, in addition to the last contract, an order for 100 coal cars (gondolas), propose constructing six cars per day, and working their hands nine hours.

There are various rumors afloat to the ef-

fect that the Greenville Rolling Mill will start up at once, and numerous "notes of prepar-ation" give credence to that belief.—Mercer

The Lebanon Manufacturing Campany have secured a contract for the construction of as many horse cars as they are capable of building, from this time forward until March.
The rolling mill at Scottdale still remains
idle. The blast furnace continues in blast.

"Tubal Cain," in the Sharon Herald of Tubal Cain," in the Sharon Heraid of the 7th inst., says: In Sharon, for the week ending Feb. L—At the Old Mill, puddle, guide and hoop mills double turn; bar and sheet mills, single turn; plate mill and nail sheet mills, single turn; plate mill and nail factory, off; chain factory still working off, as usual; all fires going. A new enterprise has been started at these works—we mean the washer factory. It went on last week one and a half turn, with orders enough ahead to keep on that time until next July. At the New Mill, same as last week, with no restricted the plant of particular change to note; everything run-ning smoothly and likely to remain so. At Middlesex, six furnaces on; stopped two days on account of high water. Mr. Braddays on account of high water. Mr. Brad ley tried his steel manufacture last weel but does not seem to have been successful In Sharpsville, some trouble is being had at at Mount Hickory. It is a difficult matter to start up a furnace that has stood time's to start up a furnace that has stood time's racket as long as this one has. The Old Mill, in New Castle, went on Monday last, the men agreeing to take white money for four

The Pheenix Iron Company have at work now over 2000 men, so that the wages paid fortnightly, provided they average \$2 a day, which, it is said, they do, will amount to \$48,000, or \$96,000 per month.

### PITTSBURGH AND VICINITY.

D. W. C. Carroll & Co., of the Fort Pitt Steam Boiler Works, are working up to their full capacity in all departments. The firm report frequent inquiries from abroad for lighters, propellers, &c., in a finished condi-

The nail mill and factory of Shoenberger & Co., has been stopped since January 22 for the purpose of putting in a new engine. This will be done by February 10th or 15th,

and the works will again resume operations
Mr. Thomas M. Carnegie has been ap-Thomson Steel Company, Limited, to fill the vacancy caused by the death of Mr. David McCandless.

IcCandless.

Brown's Mill, Pittsburgh, is running full in all departments.

Wm. Clark & Co., Solar Iron Works,
Pittsburgh, are rapidly filling up their mill
with workmen, most of the furnaces being
on last Monday. They expect to be on full

in a few days.

The case of Seaman, Young & Sleeth vs Jones & Laughlins, which has been on trial several days, in Common Pleas No. 2, at Pittsburgh, is a suit for \$20,000 damages. The plaintiffs hold the patent for Seaman's rolls, and claim that the defendants have

# sent out a circular injurious to their patent

There will be put into operation at once, at the Baltimore and Ohio Railroad rolling mill, at Cumberland, four additional furnaces mili, at Climberiala, in the puddle mill, all of them being double.
Two furnaces will also be started in the bar
mill. Ten additional puddlers and helpers will be employed, making, with other assistants, about 25 more hands than the mill is now working

The Eagle Machine Works, Bucyrus, manufacturers of double, single and portable saw-mills, report business as excellent, They have now under contract four saw-They have now under contract four saw-mills, the machinery for the Nevada Bend-ing Company, one bolting saw-mill, two portable 10 and 12-horse-power engines, and two Siamese-twins duplex engines. The Iron Era says: The Lawrence mill has started up, having had her engine put into thorough repair. The Belfont mill is

on full time

The Jefferson Iron Works, at Steubenville, are on full. The nail factory is being run to its full capacity.

The Beuster Steam Wire and Iron Works,

The Beuster Steam were and tron works, at Toledo, have been established for four years. They shipped recently a large job of cresting for the new school-house at Massillon. They also have recently shipped a large lot of grooved iron-wire stall guards to Tennessee, and have a contract on hand for

Tennessee, and have a contract on hand for cresting the large jail at Delaware.

A correspondent, writing from Martin's Ferry, gives the following information regarding the industries at that place: Business is much better in this town than heretofore. The Buckeye Glass Company's large factory presents a busy scene. They have plenty of orders. The large cooper shops of Park & Means, which were destroyed by fire, are rebuilt of fire-proof materials.

and strength. This firm will commence making barrels in a few days. The Laughlin Nail Company's mill makes good time, and there appears to be no difficulty in disposing of all the nails that can be made. L. Spence's large thrashing-machine works are running to their full capacity, preparing for the coming season. The thrashing-machine shop of E. J. Hoyle & Brother is also in full operation. These two works had a very successful season the past year. H. War-wood, manufacturer of picks and rakes, has also some orders. Thomas G. Culbertson's foundry is kept busy on heavy castings for the mills and blast furnaces in this vicinity. The foundry of Spence, Baggs & Co. is running, and can report a very good supply of orders.

Messrs. McGowan & Bliss, Cincinnati are manufacturing 40 hydraulic presses for Wilson & McCallay, tobacco manufacturers, of Middletown. Besides these, they are quite busy on orders for machinery of variincluding their hydraulic

ous kinds, including their ayard new orders.

The Iron Clad Paint Company, of Cleveland, last month sold to Barney & Smith Manufacturing Company, of Dayton, a car-load of 20,439 pounds of dry Rossie iron clad paint; also a carload of 20,909 pounds to parties in St. Louis, besides filling orders for several railroads. They have also filled orders for the Keystone Bridge Company, of Pitts-burgh, Pa. This company sold more valid for the Keystone Bridge Company, of Pitts-burgh, Pa. This company sold more paint in January, 1879, than it has ever sold in January and February of any previous year for the past 10 years. This is evidence that trade is reviving, and that the iron clad paint is known and appreciated.

The furnace of the Girard Iron Company

is in full operation. It has been in blast for over 19 months, and will still run for some

James Ward, of Niles, was granted a dis-charge in bankruptcy in the United States Circuit Court at Cleveland.

The employees of the White Sewing Machine Company, Cleveland, are about 400 in number. This firm at present is turning out goo machines per week.

The Cleveland Foundry, Bowler, Mahar &

Brayron, proprietors, has at present all the work on hand that can be attended to. The Cleveland Rolling Mill Company about completed essential repairs at their extensive works, and a general resumption of business is anticipated soon in all the de-

partments The Cuyahoga Furnace Company employ 62 workmen. This company formerly gave steady employment to about 200. Bourne & Knewles employ 45 men at their

out and washer works on Main street,

The Forest City Spring Company have 60 en and boys engaged at their The Supreme Court of Obio has granted a

writ of quo warranto in the case of Brown, Bonnell & Co., and thus the whole question as to the legality of the late election will be brought before that body.

The North American Cutlery Company, of Painesville, have been incorporated, with a

capital stock of \$30,000.

The Cleveland Rubber Co. are so driven with orders that they have been compelled to put on a night force, being two months behind with their orders. These are principally for belting, but their orders for hose of all kinds are also larger than ever before at this time of the year. This company has machinery on the way from the East which will increase their capacity about one-eighth. They also contemplate building an addition to their works in the spring?

### INDIANA.

Moore & Kerrick, Indianapolis, have con nected a machine shop, iron and brass foun-dry with their establishment.

At Green Castle the nail mill and factory have been making full time since Jan. 6.

### KENTUCKY.

The Princess Furnace has blown out for an indefinite period. MICHIGAN

President Pullman has sent an order to the company's shops, at Detroit, for the construction of eight palace sleeping cars, to embody all the latest improvements. Four of these will be used upon the London and Great Northern Railway, in England, and four upon the New York, Lake Eric and Wastern. The cars will cost statem. and Western. The cars will cost \$14,000

### Tariff Allowances for Damage.

Washington, Februray 12.—The follow-ing circular has been issued by the Secretary of the Treasury to collectors of customs: The regulations governing allowances for

damage occurring to imported merchandise on the voyage of importation, are hereby amended, as follows:

Articles 507 and 509, which require the concurrence of the general appraiser in the estimate of damage, are hereby repealed.

Article 511 is amended so as to read as follows: Allowance for damage can be made only after due claim and proof, and where only after due claim and proof, and where the same is found by the examining officers, on actual inspection and examination, to be a substantial and actual damage received during the voyage of importation. If the articles be contained in a package, the pack-age must be opened, in order that the extent of the actual damage may be ascertained. In the following classes of merchandise it may not be necessary, in order to properly may not be necessary, in order to properly may not be necessary, in order to properly appraise the damage, to require that each and every package of the merchandise shall be opened, but not less than ten per centum of such packages shall be opened, the open-ing of a greater number to be left to the discretion of the appraiser. Green and dried fruits in packages; sardines, pickles and other articles in sealed packages; pepper, pimento and mace, maccaroni, soda-ash and caustic soda ; sugar in mats or bags ; rice

in bags.

Of green fruit, not less than 10 per cent.

of the packages of each marked on the invoice shall be opened and examined. Of sardines, pickles, sauces and other like tyricties in sealed bottles, jars or cans, not less than 10 per cent. of the outer packages shall be opened and examined, but the numin bags.

The iron roof, built by Pittsburgh parties at a cost of \$1750, is a model of neatness and strength. This firm will commence making barrels in a few days. The Laughlin Nail Company's mill makes good time, and there appears to be no difficulty in disposing of all the nails that can be made. L. Spence's large thrashing-machine works are running to their full capacity, preparing for the coming season. The thrashing-machine shop of E. J. Hoyle & Brother is also in full in packages and pepper in bags may be averaged by the discretion of the appraiser. Of the other articles mentioned, not less than 10 per cent. of the examination of a greater number is left to the discretion of the appraiser. Of the other articles mentioned, not less than 10 per cent. of the examination of a greater number is left to the discretion of the appraiser. Of the other articles mentioned, not less than 10 per cent. of a greater number is left to the discretion of the appraiser. Of the other articles mentioned, not less than 10 per cent. of a greater number is left to the discretion of the appraiser. in packages and pepper in bags may be examined by taking proper samples from the packages by means of triers, where such mode of examination is practicable. (Extract from circular No. 129 of 1878.)

Articles 512 and 513 are hereby repealed, and the following is prescribed: If the importer be dissatisfied with the return of the appraiser, either as to the extent of damage or his action in refusing any allowance on account of failure to produce satisfactory proof of sound ahipment, he may file a notice with the collector of such dissatisfacnotice with the collector of such dissatisfa-tion and have a reappraisement by a mer-chant appraiser and general appraiser, as authorized by section 2928 of the revised statutes and the regulations prescribed for the re-appraisement of imports in Articles 422 to 428, inclusive. At the earliest day practicable after the receipt by the collector of the award of damage, he will cause notices of such award to be posted in a conspicuous place in the Custom House, and the 24 hours during which, under Article 420, a reappraisement may be demanded, will commence from the close of the day on which such notice is posted.

No reappraisement of damaged goods can be had except upon an actual inspection of the merchandise by the merchant and general appraiser, and care will be taken on eral appraiser, and care will be taken on such reappraisement to confine the award of damage to that actually occurring on the voyage of importation, without allowance for any damage which may have occurred after the landing of the goods in the United States. Article 519 is amended so as to read as follows:

as follows:

Damage on the voyage of importation
must be ascertained at the port where the
vessel originally enters, and cannot be certified from any other port. The bill of lading may be accepted as prima facie evidence
of sound shipment.

The completeness and interest of some of the American exhibits at Paris was a sur-The completeness and interest of some of the American exhibite at Paris was a surprise to foreign newspaper correspondents. A writer in the European Mail of Jan. the thus describes the exhibit of A. Field & Sons, of Taunton, Mass.: As a general rule outsiders do not take any especial notice of such dry and uninteresting matters as nails, tacks, or brads. It was, however, impossible to pass the exhibit of the Messrs. Field without stopping to inquire how the artistic effect was produced. You saw a full history of the works; its capacity, some 50,000,000; its extent, the entire length of the works, 700 feet; the number of varieties, no less than 20,12; and the date of its foundation, 1827—all these particulars told in the products of the factory. There were tacks, copper, brass, tin, and iron, for carpets, brushes, and gimp; tacks, patent coated in colors, red, green, blue, drab, and maroon; lining, saddle and tufting nails: buttons for upholstery, glaziers' points, japanned lining nails, common and patent brads, annealed trunk and clout, hob and Hungarian nails. In fine, there was not a single description of nail, tack, or brad, from the largest to the most microscopic, in single description of nail, tack, or brad, from the largest to the most microscopic, in every metal used for nails, in colors not seen before, that was not exhibited, either in the legend that told the story of the house or in the innumerable compartments of the glass stand that surrounded the exhibit. At the back was an admirable bird's-eye view of the factory, exceedingly unlike poor Artemus Ward's panorama, inasmuch that it is really excellent as a work of art. That the Messrs. Field obtained a silver medal is no marvel; the only wonder is that they no marvel that they wonder is that they no marvel; the only wonder is that they did not gain what they fully merited—either the gold medal or a still higher honor. A more remarkable exhibit in its peculiar line—and I say this with a personal experience of all the international exhibitions—I never remember to have seen.

We are informed by the Spanish Consul in New York, in answer to inquiries, that under the official decree now in force, admitting machinery and cattle duty free into the "Districto Oriental," or late insurrec-tionary provinces of Cuba, a fair trade is in progress. The hope is that the fertile and once productive estates now lying in ruins, will recover more rapidly under the encouragement thus given; but as yet there is no decided improvement. In fact, as suggested by the assistant consul, time will be required by the impoverished planters in be required by the impoverished planters in which to gather their feeble resources, and further time must elapse before orders for much new machinery can be given. Messrs. Ward & Co., of the Havana steamship line; also the Messrs. Owen, agents in South street, speak of trade at present as unusually dull. Considerable quantities of material for portable railways continue to go forward (for the week ending January 25 not less than 8000 packages, valued at \$81.825), also boilers, evaporating pans, \$81,825), also boilers, evaporating pans, &c., but nothing unusual; and as regards the "Districto Oriental," the latter have not yet received a single order, though in-quiries are numerous. Sailing vessels doubt-less afford superior facilities for direct ship-ments to Eastern Cuba; but steamers will be preferred when dispatch is necessary, as the railways extending from Havana to Eastern Cuba afford ample means of trans-portation on the island. As regards cattle, shipments are almost exclusively from Galveston and other ports in Texas.

The great manufacturing establishment for the Ansonia Clock Company, the largest of its kind in the world, is now so far advanced that the works will be opened for business that the works will be opened for business this coming spring, and nearly or quite at their full capacity. The building and machinery together will represent an investment of \$250,000. A Corliss engine of large power is in course of construction, and contracts for machinery, embracing tools of every description, are being executed by Pratt & Whitney, of Worcester, Mass., a company in Waterbury Comp. and Messife. Foot Power Bracket Saws





Scroll Sawing and Drilling Attachment. Iron Table, adjustable for Inlay working parts of from and steel; weight, with box, 30 pounds; 1000r, 32 inches; 12-inch belt wheel; s-inch balance wheel; arms; 16

Price, including all the attachments and the box, - \$3.00

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PERFECT HORSE SHOE NAIL.

The well-known desirable properties of a perfec nail are, that the FORT should be sharp, the SHANK stiff, to drive without crippling under the hammer, sort enough to clinch readily, while sufficiently tough to avoid all danger from the "drawing the clinch" or breaking the neck under the head. These properties we claim for the

"ANVIL HORSE NAILS."

In the process of manufacture the metal is com-pressed under the head, which gives the nail great strength where it is required (between the shoe and hoof), and the cold rolling gives it a stiffness attained in no other way, while the quality of the metal used insures a clinch and point un surpassed by any nail ever offered in the market. Samples and prices sent on application.

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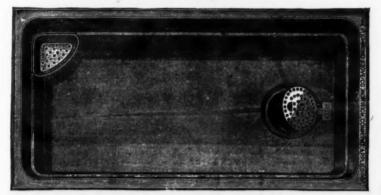
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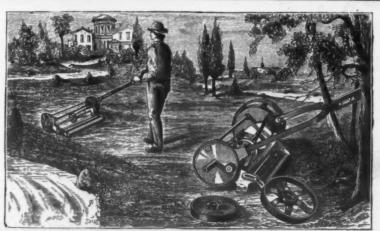
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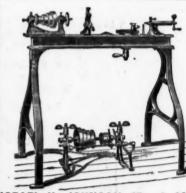


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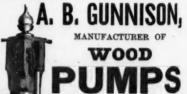
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February 10,
The Iron Age Directory
and Index to Advertisements.
Air Compressors (Layton, James 11 Water, Brooklyn, N. Y
Briscoe S. B. & Co., Potesville, Pa
Clark 7m. A. Westville Conn. Clark 7m. A. Westville Conn. Clark 7m. A. Westville Conn. Schambers, N.Y. Snell Mfg. Co., 8: Beekman, N.Y.  Axes, Edge Tools, &cc., Manufacturers of. D. R. Barton Tool Co., Rochester, N.Y.  30
Jones M. H. & Co., Collaborator of Jones M. H. & Co., Fisherville, N. H.  Brown D. Arthur & Co., Fisherville, N. H.  Cox R. & Sons, Winsted. Conn.  Hotchkiss Guy C., Field & Co., 622 E. 14th, N. Y.  Sheldon & Co., Abburn, N. Y.  Wilson, Walker & Co., Fittsburgh, Pa.  Babbit Meta!  Philadelphia Smelting Co., 12th and Noble, Phila30
### Philadelphia Smelting Co., 18th and Noble, Phila. 30  Barb Wire. Thorn Wire Hedge Co., 34 Canal, Chicago, Ill
Bevin Bros. Mfg. Co., Easthampton, Conn
Backus Q. S., 102 Chambers N. Y
Millers Falls Co., 74 Chambers, N. Y.  Biland A wains Fixtures. Boston Blower Co., Boston, Mass. Biocks, Tackle, Makers of. Burr & Co., 31 Peck Slip, N. Y. McMillan Wm. H. & Bro., 113 South, N. Y. Penfield Block Works, Lockport, N. Y. Providence Tool Co Providence. R. I. Welf John, 7 and 9 Bedford, N. Y.  Belt Cutters.
Boit Cutters.  Howard Iron Works. Buffalo, N. Y
Tiebout W. & J., 20 Peart, N. Y.  Brass, Manufacturers of.  Ansonia Brass and Copper Co., 19 Cliff, N. Y.  Bridgeport Brass Co., Bridgeport, Conn.  Brass Goods Mfg. Co., 28 Peart, N. Y.  Davel John & Sons, 100 John, N. Y.  Holmes, Booth & Haydens, 49 Chambers, N. Y.  Holmes, Booth & Haydens, 49 Chambers, N. Y.  Manhattan Brass Co., 58 Reade, N. Y.  Plume & Atwood Mfg. Co., 80 Chambers, N. Y.  Scovill Mfg. Co., 41 Broome, N. Y.  Waterbury Brass Co., 26 Broadway, N. Y.  Brass Castings.  D. K. Miller Lock Co., 511 Cherry, Phila  Brass Founders.  Reeves Paul S., Philadelphia.
Wateroury Press Co., 821 Cherry, Phila.  D. K. Miller Lock Co., 821 Cherry, Phila.  Brass Founders. Reeves Paul S., Philadelphia.  Brick Machines.  Gregg Brick Co., 52 Walnut, Philadelphia
Butcher and Shee Kuives, Manufacturers of, Wilson John, Shemelid, England
Calipers. Victor Sewing Machine Co., Middletown, Conn
Smith R. D. & Co. Platsvine, Com. Striffier C., 650 & 611 Ninth ave. N. Y. Wilcox & Howe, Birmingham, Conn. Carriage Springs. Dexter Spring Co., Hulton, Pa Rome Trestic Co. (Limited), Rome, N. Y. Car Axles. Robert A. & P. & Co., 265 S. 4th, Philadelphia.
Car Pusher (Giant). Penneld Block Works, Lockport, N. Y. Casters. Phoenix Caster Co., Indianapolis, Ind. Carlets John, 28 Monroe, N. Y. Chisels, Manufacturers of. Buck Bros., Milibury, Mass. Checks.
Buck Bros., Milibury, Mass. Chacks. Foot James D. 40 Broadway, N. Y. Clock Springs, &c. Cary & Moen, 24 W. 29th, N. Y. Dunbar Bros. Bristol. Conn Clothes Pin. (Metallic) Brower J. L & Son, 26 Greenwich, N. Y.
Coal, Miners of. Pardee, A. & Co., 111 Broadway, N. Y. Tennessee Coal & Railroad Co., Tracey city, Tenn
The Hoboken Coal Co., Jersey City, N. J.  Coal Hods. Pierce Geo. N. & Co., Buffalo, N. Y.  Coal Vasca. Shepard Sidney & Co., Buffalo, N. Y.  Coffee and Spice Hills. Lane Brothers, Millbrook, N. Y.  Enterprise Mg. Co., Philadelphia, Pa.  Commission Merchanidelphia, Pa.  Commission Merchanidelphia, Pa.  Compasses and Dividers, Manufacturers of,  Semis Call How. & Tool Co., Springfeld, Mass., 12&  Coppers' Tools. &c., Manufacturers of,  Coppers.  The New Hayen Copper Co., 255 Pearl, N. Y.  The New Hayen Copper Co., 255 Pearl, N. Y.
Semis & Call Hdw. & Tool Co., Springfield, Mass., 12& Coopers' Tools & &c., Manylactic sr of. D. R. Barton Tool Co., Rochester, N. Y. Copper. The New Haven Copper Co., 255 Pearl, N. Y. Corn Huskers, Chambers, Boring & Quinlan, Decatur, Ill. Corn Shellers. The Gould Mfg. Co., Seneca Falls, N. Y. Corrugated Iron.
The Goulds Mfg. Co. Seneca Falls, N. Y. Corrugated Iron. Moseley Iron Bridge and Roof Co., 5 Dey, N. Y. Crucibles, Manylacturers of, Wile, Siedel & Co., 70 Market, Phila. Cupolas & Hlowers.

Fisher & Norris, Tenton, philadelphia Smelling Co., 17th and Noble, Phila. 30 Richardson Mfg. Co., Woroster, Mass. 32 Architectural Iren Werk. Architectural Iren Werk. Architectural Iren Werk. 4 Rina Iron Co., 66 Goerck, N. Y.	F
Arenneuton Co., 66 Goerck, N. Y.  Augers, Bilas, etc., Konsurfacturers of. Clark Wm. A. Westville, Conn. Clark Wm. Westville, Conn. Conn. Valley Hdw. Co., 68 Chambers, N. Y. Snell Hig. Co., 81 Beekman, N. Y.  8	F
Conn. Valley How. Co., of Chambers, N X	1
Snell Mfg. Co., of Decamandary  Axes, Edge Teols, &c.c., Manufacturers of, D. R. Barton Tool Co., Rochester, N. Y.  Jones M. H. & Co., Cohoes, N. Y.  21  22 a. S. Rayings, &c.c., Manufacturers of.	1
Jones M. H. & Co., Cohoes, N. Y. Jones M. H. & Co., Cohoes, N. Y. Axiess, Springs, &cc., Managacturers of. Brown D. Arthur & Co., Fisherville, N. H.  School, Co., Springs, &c., Springs, Spring	
Sheldon & Co., Auburn, M. Wilson, Walker & Co., Pittsburgh, Pa	
Barb Wire. Wades Co. 24 Capal, Chicago, Ill.	F
Bellows, Manufacturers of. Newcomb Bros., 98 Chambers, N Y	
Bells (Sleigh,)	
Bevin Bros. Miles of.  Helting. Makers of.  Alexander Bros., 412 N. 3d., Philadelphia	
N. Y. Beitings and rassing to the state of t	F
Maxheimer John, 247 and 249 Pearl, N. Y.       9         Bit Braces, Manufacturers of.       Backus Q. S., 102 Chambers N. Y.       21         Millers Falis Co., 74 Chambers, N. Y.       21	F
Millers Falls Co., 74 Chambers, N. Y	F
Millers Falls Co., 74 Chambers, N. Y. 21  Blind A waing Fixtures.  Sosion Blower Co. Boston, Mass. 24  Blocks. Tackle, Makers of.  Blocks. Co., 21 Peck Silp, N. Y. 24  Edillan Wm. H. & Bro., 113 South, N. Y. 44  Penfield Block Works, Lockport, N. Y. 35  Providence Tool Co Providence, R. 134  Welr John, 7 and 9 Bedford, N. Y. 30	F
Penfield Block Works, Lockport, N. 1 35 Providence Tool Co Providence, R. I 34 Weir John, 7 and 9 Bedford, N. Y 30	E
Howard Iron Works. Buffalo, N. Y	F
Wiley & Russell, Oreenneid, Mass. 40 Bolts (Screw.) Coleman Eagle Bolt Works, Philadelphia. 11 Beet and Shee Heel Stiffeners. Lyon N., Albany, N. Y. 13 Brass Butts, Maker of. Tiebout W. & J., 290 Pearl, N. Y. 12	F
Lyon N., Albany, N. Y.  Brass Butts, Makers of. Tiebout W. & J., 250 Pearl, N. Y.	6
Tipbout W. & J., 290 Pearl, N. Y  Brass, Mansfacturers of.  Ansonia Brass and Copper Co., 19 Cliff, N. Y. 2  Bridgeport Brass Co., Bridgeport, Conn. 2 2  Brass Goods Mfg. Co., 28 - Pearl, N. Y. 33  Davol John & Sons, 100 John, N. Y. 2  Holmes, Booth & Haydens, 49 Chambers, N. Y. 2  Holmes, Booth & Haydens, 49 Chambers, N. Y. 2  Plume & Atwood Mfg. Co., 53 Reade, N. Y. 2  Plume & Atwood Mfg. Co., 50 Chambers, N. Y. 2  Scovill Mfg. Co., 43 Heroome, N. Y. 2  Waterbury Brass Co., 296 Broadway, N. Y. 2  Brass Castings.  D. K. Miller Lock Co., 821 Cherry, Phila. 8  Brass Founders.  Reeves Paul S., Philadelphia. 38  Ryick Machines. 38	6
Brass Goods Mg. Co., 282 Pearl, N. Y	6
Mannatian Brass Co., 50 Chambers, N. Y	6
Brass Castings. D. K. Miller Lock Co., 821 Cherry, Phila	
Reeves Paul S., Philadelphia	1
Bridge Builders. Moseley Iron Bridge and Roof Co., 5 Dey, N. Y 35 Butcher and Shee Knives. Manufacturers of. Wilson John, Sheffeld, England	I
Wilson John, Shemeld, England	
Butts and Hinges, American Solral Spring Butt Co., 82 Boekman, N. Y. 38 Sabin Mfg. Co., Montbeller, Vt	1
Calipers. Victor Sewing Machine Co., Middletown, Conn34 Carriage Bolts, Makers of. Townsend, Wilson & Hubbard, Philadelphia12	1
Townsend, Wilson & Hubbard, Philadelphia	,
Carriage Hardware, Makers of.           Hayden & Smith, Auburn, N. Y.         12           Pim Richard P., Wilmington, Del.         6           Smith H. D. & Co., Plantsville, Conn.         12           Striffler C., 59 & 632 Ninth ave., N. Y.         4           Wilcox & Howe, Birmingham, Conn.         31	1
Carriage Springs. Dexter Spring Co., Hulton, Pa Rome Trestle Co. (Limited), Rome, N. Y	
Roberts A. & P. & Co., 265 S. 4th, Philadelphia	1
Car Pusher (Giant). Penfield Block Works, Lockport, N. Y	
Casters. Phoenix Caster Co., Indianapolis, Ind	1
Clock Springs, &c. Cary & Moen, 234 W. 29th, N. Y	1
Brower J. I. & Son, 385 Greenwich, N. V.	ľ
Coal, Miners of. Pardee, A. & Co., III Broadway, N. Y. Tennessee Coal & Railroad Co., Tracey city, Tenn. of The Hoboken Coal Co., Jersey City, N. J.	
The HOOKen Coal Co., Jersey City, N. J. 6 Coal Hods. Pierce Geo. N. & Co., Buffalo, N. Y. 26 Coni Vases. Shepard Sidney & Co., Buffalo, N. Y. 27 Coffee and Spice Wills. Lane Brothers, Millbrook, N. Y. 24 Enterprise Mg. Co., Philadelphia, Pa. 27 Companses and Blviders, N. Y. 16 Companses and Blviders, Massifacturers of, Bemis & Call Hdw. & Tool Co., Springfield, Mass. 12&3 Coopers' Tools. & Cc., Manufacturers of, D. R. Barton Tool Co., Rochester, N. Y. 36 Coppers.	1
Snepard Sidney & Co., Buffalo, N. Y.  Coffee and Spice Mills.  Lane Brothers, Millbrook, N. Y.  Enterprise Mr. Co. Philadelphia Pa	
Commission Merchants. Field Alfred & Co., 93 Chambers, N. Y. Compasses and Dividers. Manufacturers of	
Bemis & Call Hidw. & Tool Co., Springfield, Mass., 12&31 Coopers' Tools. &c., Mansfactus ers of. D. R. Barton Tool Co., Rochester, N. Y	0
Corn Huskers. Chambers Baring & Outplan, December III	1
Corn Shellers. The Goulds Mig. Co., Seneca Falls, N. Y Cornagated Iron.	
Mosoley Iron Bridge and Roof Co., 5 Dey, N. Y3 Crucibles, Manufacturers of. Wile, Siedel & Co., 709 Market, Phila	3
Coppers. The New Haven Copper Co., 255 Pearl, N. Y. Corn Huskers. Chambers, Boring & Quinlan, Decatur, Ill	5
Cutlery, Importers of.  Boker Hermann & Co., 101 Duane, N. Y	10
Friedmann & Lauterjung, 14 Warren, N. Y	0
Goodell Company, Antrim, N. H. John Russell Cutlery Co., 90 Chambers, N. Y38 Marx Bros., 430 Broadway, N. Y.	3
Meriden Cutlery Co., 49 Chambers, N. Y	0 0
Differential Pulley Blocks. Yale Lock Mfg. Co., 53 Chambers, N. Y	0
Dinner Pail & Lanterns, Haight, Jos. Portchester N. V.	
Discount Tables. Jennings S. H., Deep River, Conn	6
Door and Gate Springs. Dunne P. R., 182 Fulton, N. Y. Van Wagoner & Williams, 82 Beekman, N. Y. Drilling Machines, Makera of.	8
Drilling Machines, Makers of, Thorne, De Haven & Co., Philadelphia. Wiley & Russell, Greenfield, Mass.  Drop Forgings. Rose Wm. & Bros., West Philadelphia.	6
Drop Foreings. Rose Wm. & Bros., West Philadelp', b Pa	8
Beecher & Peak New Howen Comm	
Gregg M. & Son, Rochester, N. Y	7
COUNTRY OF STREET	- 1
Stokes & Payeteh Phyticago, Ill.	0,0
Elevator Backets. Rowland T. F., Brooklyn, N. Y. Emery Wheels. Lehich Valley V.	5
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K	ngines (Lecemetive). Baldwin Lecemetive Works, Philadelphia, Pa 6	
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	Harris Wm. A., Providence, R. I.  Lovegrove & Co., Philadelphia, Pa.	
	Payne B.W. & Sons, Corning, N. Y. 10 if spley & Wells, Binghamton, N. Y. 34 Wetherill Robt. & Co., Chester, Pa. 34	
	xpert Factors. Jennings S. H., Deep River, Conn	
	Landis Egra F., Lancaster Pa	I
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E	aucets. Wood Penfield Block Works, Lockport, N. Y	1
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*	Carr J. & Riley, & John, N. Y.  Sless, F. W., & John, N. Y.  Sless, Manufacture of Sless,	1
	Carr J. & Riley, 52 John, N. Y. 30 Fisher Joseph S., 411 Commerce, Phila 15 Moss F. W., 50 John, N. Y. 32	1
*	Moss F. W., So John, N. Y. 32  Album F. Hi. Works, So Chambers, N. Y. 8  Barnett G. & H., 41 and 42 Richmond, Phila 22  Disston Henry & Sons, Phila. 22  Disston Henry & Sons, Phila. 33  Everhard James M., Scranton, Pa. 35  Heller & Bros., Newark, N. J. 8  4 Sonson Bro., 170 and 174 N. 4th, Phila. 8  New Addrey & Bro., 170 and 174 N. 4th, Phila. 8  New Addrey & Bro., 170 and 174 N. 4th, Phila. 8  New Addrey & Bro. 170 and 174 N. 4th, Phila. 8  New Addrey & Bro. 170 and 174 N. 4th, Phila. 8  New Addrey & Bro. 170 and 174 N. 4th, Phila. 8  New Addrey & Bro. 170 and 174 N. 4th, Phila. 8  New Addrey & Bro. 170 and 174 N. 4th, Phila. 8  New Addrey & Bro. 170 and 174 N. 4th, Phila. 8  New Address and 184 N. 4th, Phila. 8  Sepanson L. 184 N. 4th, Phila. 8  Spencer I. R. & Son Sheffield England. 10  G. F. Stott, Rochester, N. Y. 8  Fire Brick, Makers of.	
	Disston Henry & Sons, Phila.	
	Heller & Bros., Newark, N. J	
	McCaffrey & Bro., 1742 and 1734 N. 4th, Phila	2
	Paul Chas. B., Williamsburgh, N. Y	
	G. F. Stott, Rochester, N. Y	
	G. F. Stott, Rochester, N. Y.  § Fire Brick, Makers of. Borgner & O'Brien, Philadelphia, Pa	
	Gardner Brothers, Pittsburgh, Pa	1
	Kreischer B. & Sons, 58 Goerck, N. Y	1
	Newton & Co., Albany, N. Y	I
1	Watson John R., Perth Amboy, N. J	1
1	Bacder, Adamson & Co., 730 Market, Phila	
1	The American Machine Co., Philadelphia. 21  Forges, Portable, &c., Empire Portable Forge Co., Cohoes, N. Y	
ľ	Brown T. J. Bockwood Tann	1
1	Foundry Facings.  Paxson J. W. & Co., 514 Beach, Phila	1
1	Whitehead Bros., 517 W. 15th, N. Y	1
1	Furnaces, Makers of. Richmond & Potts, up S. Fourth, Phila Pa	١
1	Furnaces, Makers of. Richmond & Potts, 119 S. Fourth, Phila., Pa  Furnaces (Charceal.) Mathleu Jean A., Room 2, 15 South 7th, Phila 5	l
1	Furniture Springs. Carey & Moen, 234 W. 29th, N. Y	1
1	Gaivanized Iron. Lefferts Marshall, Jr., 90 Beekman, N. Y	
1	Gauges. Richards, Hand & Taylor, 22d and Wood, Phila29	1
ľ	Judson Junius & Son, Rochester, N. Y37	ľ
1	Grindstones.  Wood Walter R., 283 and 285 Front, N. Y	1
1	Guns, &cc. Schoverling, Daly & Gales, 84 Chambers, N. Y22 Windmuller Louis & Roelker, 20 Reade, N. Y16 Gunnowder, Makers of	١
1	Gunpowder, Makers of. Kneeland F. L. (Dupont) 70 Wall, N. Y	1
-	Lafin & Rand Powder Co., 26 Murray, N. Y30  Handles, Makers of. Hundley & Hanks, 79 Reade, N. Y34	ı
1	Hundley & Hanks, 79 Reade, N. Y	Ì
	Hardware Commission Merchants. Graham & Haines, 113 Chambers, N 9 Hundley & Hanks, 79 Reade, N, Y	1
	Hardware Dealers. Lloyd, Supplies & Waiton, 625 Market, Phila	١
	Shepard Sidney & Co., Buffalo, N. Y	1
1	Hardware Importers. Boker Hermann & Co., 101 Duane, N. Y	
	Hardware Manufacturers. American Spiral Spring Butt Co., 82 Beekman, N.Y 38 Coulter Floring & Co. 82 Charless N. Y.	
	Cowles Hardware Co., Unionville, Conn. 20 Dibble Mfg. Co., Trenton, N. J.	1
	Lioyd, Supplee & Walton, 625 Market St., Phila., Pa.21 Maltby, Curtiss & Co. 24 Reade, N. Y	ı
1	Windmullor Louis & Roelker, 20 Reade, N. Y	
	Russell & Erwin Mrg. Co., New York. Shepard Hardware Co., Buffalo, N. Y. Stanley Works, New Britain, Conn.	ı
٠	Union Mfg. Co., 99 Chambers, N. Y	۱
1	Many Francis 143 Chambers, N. Y	
	Snepar's Maney & Co., Bullato, N. Y	1
3	Covert E. & J. C., Farmer Village, N. Y.  Harness Snaps. Covert Mig. Co., Troy, N. Y	
	Hay Knives. Holt Hiram & Co., East Wilton, Me3	
6	Hinges. Lewis, Oliver & Phillips, Pittsburgh, Pa	
6	Chambers, Bering & Quinlan, Decatur, Ill	
4 7	Heisting Engines, Makers of.   Crane Bros., Mfg. Co., Chicago, Ill. 9   Davis A. J. & Co., Newark, N. J. 37   Mundy J. S., Newark, N. J. 35	ا
4 3	Mundy J. S., Newark, N. J.	5
0	Hoisting Machines.  Box Alfred & Co., 312 Green, Phila	9
1	Hollow Chilled Rolls. Totten & Co. Pittsburgh, Pa. Hooks (Cotton & Bale.) New York Handle & Mallet Works, 456 E. Houston;	
0	New York Handle & Mallet Works, 456 E. Houston13	3
0	Horse Clippers. Boker, Hermann & Co., 107 & 103 Duane, N. Y	0
	Horse Nails, Makers of, Anvil Nail Co., 55 Washington, N. Y. Ausable Horse Nail Co., 4 Warren, N. V. FP Horse Nail Co., (Leveland, O. National Horse Nail Co., Vergennes, Vt. Northwestern Horse Nail Co., Chicago, Ill. 32 Putnam Nail Co., Neponset, Mass. 23 Saranac Horse Nail Co., Plattsburg, N. Y.	1 00 H
3	National Horse Nail Co., Vergennes, Vt	-
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13	Burden Iron Works, Troy, N. Y. Rhode Island Horse Shoe Co., Providence, R. I31 Schoenberger & Co., Pittsburgh, Pa	8
0	Hydrants, &c.  HcLean John, 300 Monroe, N. Y	5
0	Mohawk & Hudson Mfg. Co., Waterford, N. Y3 Hydraulic Jacks. Dudgeon Richard, 24 Columbia, N. Y3	
8	Insurance, Boiler. Hartford Steam Boiler Inspection & Insurance Co3:	
0 0	Iren Brokers. Boynton Geo. A., 70 Wall, N. Y	4
10	Iren Brokers. Boynton Geo. A., 70 Wall, N. Y Collins H. E. & Co., Pittaburgh, Pa. Etting Edward J., Philadelphia, Pa. Hatry & Friend, Pittaburgh, Pa.	4 5 4
3	Ouiney John W. of William, N. Y.	4
11	Iron Commission Merchants. Adams Hugh W., 55 Fine, N. V. Lowe S. B., Chattanooga, Fenn. Iron, Pig. Importers of. Williamson James & Co., 69 Wall, N. Y.	6
16	Iron, Pig, Importers of.  Williamson James & Co., 69 Wall, N. Y	4
,8	Abeel Brothers, 190 South, N. Y. Bonnell, Botsford & Co., Youngstown, O	4
7 36	Carmichael W. J., 130 and 132 Cedar, N. Y. Cooney Daniel F., 88 Washington, N. Y.	4
6 38	Harrison & Gilloon, 558 to 552 Water, N. Y. Hoffman J. W. & Co., 268 S. Fourth. Philadelphia	4 4 5
37	Jackson J. H. & Co., 206 and 206 Franklin, N. Y Judson B. F., 457 and 449 Water, N. Y Kane C., Pittsburgh, Pa.	4
36	Lundberg Gustaf, 38 Kilby, Boston, Mass. Ogden & Wallace, 85, 87, 85 and 91 Elm, N. Y.	4
30	Pullmann J. Wesley, Philadelphia, P. Quincy John W., of William, N. Y.	954
91	Iren, Fig. Amporters of.  Williamson James & Co., 60 Wall, N. Y.  Iron Dealers. Abeel Brothers, 190 South, N. Y. Bonnell, Botsford & Co., Youngstown, O. Borden & Lovell, 70 and 71 West, N. Y. Carmichael W. J., 190 and 130 Cedar, N. Y. Carmichael W. J., 190 and 130 Cedar, N. Y. Conney Daniel F., 8 Washington, N. Y. Huerstel G. O. Market Slip, N. Y. Harrison & Gilloon, 1,2 to 65 Waster, N. Y. Hoffman J. W. & Co., 26 8 F. Fourth, Philadelphia. Jackson, J. & Co., 26 8 F. Fourth, Philadelphia. Jackson, J. & Co., 26 8 F. Fourth, Philadelphia. Jackson, J. & Co., 26 8 F. Fourth, Philadelphia. Landberg Gustaf, 28 Kilby, Boston, Mass. Ogden & Wallace, 8, 8, 19 and 01 Elm, N. Y. Ferson & Co., 24 Broadway, N. Y.  Pullmann J. Wesley, Philadelphia, P. Quincy John W., 68 William, N. Y.  Richards D. W. & Co., 20 Mangin, N. Y.  Wallace Wm. H. & Co., Albany and Washington streets, N. Y.  Warner A. B. & Sons, 28 and 20 West, N. Y.	4

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I	Lyo	nine n & Fo	screvellows ts' To	Mfg.	akers Co., V Maker	of. Villiam	sburg, l	. Y	38
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Screw Drivers, (Improved) Makers of. Disaton Henry & Sons, Phila.	
Scroll Saws,	T
Scythes.	1
Beardsley Scythe Co., West Winsted, Conn 9 Scythe Stones.	
Shot. Are.	T
Sparks Thos. W., 121 Walnut, Philadelphia35	T
Field, Alfred & Co., 93 Chambers, N. Y	T
Shovels, Spades and Scoops.	i
Sinks, Manufacturers of.	T
Magee Furnace Co., Boston, Mass29	T
Philadelphia Smelting Co., 12th and Noble sts.,	T
Philadelphia	T
Speaking Tubes. Ostrander W. R., so Ann. N. Y.	7
Speiter. Manning & Squier, 113 Liberty, N. V	T
Osgood F. & Co., Bergen Port, N. J	t
Carey & Moen, 234 W. 29th, N. Y 3	-
Rowland Wm. & Harvey, Frankford, Phila38	1
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Steam Cookers.	V
Hale Dr. Jos., 51 Washington. Boston, Mass31 Steam Hammers, &c., Makers of.	
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Cameron A. S., East 23d, N. Y	1
Crane Bros. Mfg. Co., Chicago, III	1
McGowan John H. & Co., Cincinnati, O27	1
Storer G. W., 132 N. 3G, Philadelphia	1
Steam Winder.	1
Steel Castings, Manufacturers of.	1
Chester Steel Castings Co., Evelina, Phila., Pa38 Eureka Cast Steel Co., Chester, Pa38	1
Flagg Stanley G. & Co., 216 and 218 N. 3d, Phila38 Pittsburgh Steel Casting Co., Pittsburgh, Pa. 38	1
Steel Importers.	1
Hobson Francis & Son, 97 John, N. Y	1
Moss F. W., so John, N. Y30	
Wolff R. H. & Co., 16 Cliff, N. Y.	
Randali & Jones, 10 Oliver, Boston, Mass30	
Steel Manufacturers. Albany & Rensselaer Iron & Steel Co., Troy, N. Y 30	
Gautier Steel Co., Ld., Johnstown, Pa	
Miller, Metcalf & Parkin, Pittsburgh	1
Sanderson Bros., Steel Co., Syracuse, N. Y30	
Singer, Nimick & Co., Pittsburgh, Pa	1
Standard Steel Works, Philadelphia, Pa	
Wardlow S. & C., Sheffield, England	1
Clark & Co., 162 and 164 W. 27th, N. Y	1
Cary & Moen, 234 W. 29th, N. Y	1
Chatillon & Sons, 91 and 93 Cliff, N. Y	1
Nash & Koehler, 280 Pearl, N. Y	1
Holroyd & Co., Waterford, N. Y	
Wiley & Russeil, Greenfield, Mass	5
Ansonia Brass and Copper Co., 19 and 21 Cliff. N. Y.	0
Stove Pipe.	
Stove Repairs,	5
Metzner W. C., Chicago, Ill	4
Tucker Alarm Till Mfg. Co., Indianapolis, Ind2	9
Post C. C., Burlington, Vt	5
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	Screw Drivers, (Impresed) Mobers of. Dission Heary & Sons, Philis. Scroll Saws. Lewis Mfg. Co., Seneca Falls, N. Y. Sorthes. Deardsley Scythe Co., West Winsted, Conn

١	Dunbar, Hobard & Whidden, 116 Chambers, N. T33 Field A. & Sons, Taunton, Mass
۱	Field A. & Sons, Taunton, Mans. 9 Grundy Geo. C., 165 Greenwich, N. Y. 32 Shelton Co., Birmingham, Ct
l	Tups and Dies. Carpenter J. M., Pawtucket, R. L
l	Manning H. S. & Co., 111 Liberty, N. Y
I	Tin Plate. Importers of N. & G. Taylor Co, Philadelphia 3
l	Tin Plate. Manufucturers of. U. S. Iron and Tin Plate Co., Pittsburgh, Pa
I	Tin Ware, Stamped and Japanned.
ı	Tin Ware, Stamped and Japanned. Shepard Sidney & Co., Buffalo, N. 27 The Chicago Stamping Co., Chicago, III. 3 Teols, Enlirond and Wining. Metcarl, Paul & Co., Pitteburgh, Pa
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ı	Trowels. Bruce Geo. W., r Platt, New York35
١	Treweis. Brace Geo. W., r Platt, New York
١	Diston neary & Sons, Fains  Tabes.  Deakin Robt. T. & Co., 500 N. 11th., Phila
١	Dudgeon Richard, 24 Columbia, N. Y 31
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١	Mohawk & Hudson Mfg. Co Waterford, N. Y 34 Ventilators.
ı	Bracher Ventilator Co., 3 Park Row, N. Y 7
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	Millert & Co., Reading, Pa
	Bracher Ventilator Co., 3 Park Row, N. Y 7 Wedges.
	Wedges. Am. Sleigh and Carriage Iron Co., Boston Mass;8 Wheelbarrows.
	White Lend, Manufacturers of.
	Brooklyn White Lead Co., 89 Maiden Lane, N. Y24 Colgate Robert & Co., 287 Pearl, N. Y24
	Jewett John & Sons, 182 Front, N. Y24 Lewis John T. & Bros., 231 S. Front, Phila., Pa24
3	Window Springs, Makers of. Hammond W. S., Lewisberry, Pa
)	Wire, Manufacturers of. Cary & Moen, 24 W. 20th, N. Y
9	Gautier Steel Co., Ld., Johnstown, Pa 30 Gilbert & Bennett Mfg. Co., 273 Pearl, N. Y 29
1	Griswold J. Wool, Troy, N. Y
9	Harrison Wire Co., St. Louis, Mo
,	Prentiss Geo. W. & Co., Holyoke, Mass
5	Washburn & Moen Mfg. Co., Worcester, Mass 2
3	Wire Drawing Machinery.
0	Adt John, New Haven, Ct
5	Wire Goods, Manufacturers of. Dufur & Co., 36 N. Howard st., Baltimore, Md 3
5	Gilbert & Hennett Mfg. Co. 273 Pearl, N. Y29 Oliver E., 106 and 108 Beekman st., N. Y
0	Wire Nails. Hassall William, 63 and 65 Elizabeth, N. Y
9	Wire Rope, Iron and Steel, Makers of. Broderick & Bascom, St. Louis, Mo
3	Haigh J. Loyd, 81 John, N. Y
8	Roebling's John A. Sons, Trenton, N. J
2	Wrenches, Manufacturers of.
36	Bemis & Call Hdw. & Tool Co., Springfield, Mass. 128, 7 Coes A. G. & Co., Worcester, Mass
9	Girard Wrench Mfg. Co., Girard, Pa
ĩ	Wenther Strips. Bracher Ventilator Co., 3 Park Row, N. Y. Wedges. Am. Sleigh and Carriage Iron Co., Boston Mass., 38 Wheelbarraws. Rogers H. A., 10 John N. Y
3	Adams F. F. & Co., Erie, Pa
3	Metropolitan Washing Machine Co., 52 Cortiands,
9	Myingers F, & Co., Erie, Pa
ń	The American Machine Co., Philadelphia
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(CHICAGO, 182 Lake St.)

### Free Trade in England.

Mr. Chas. G. Leland, writing from Eng-

land, says:

Notwithstanding the boast se often repeated, that England is a free trade country, it is a most remarkable fact that there is not a country in the world which, while it would withhold the benefit of protection from other countries, suffers so much from its abuses. For in this land of free trade there is not a branch of manufactures which its abuses. For in this land of tree trade there is not a branch of manufactures which is not controlled by unions and regulated by strikes, and it would be, in fact, difficult to conceive a state of society in which the right of the consumer to bay directly from the producer is more cruelly prevented by tyrannical combinations, which, when examined, turn out to be protection in its most irritating form. For instance, a gentleman who has, despite many obstacles, thoroughly examined the fish supply of England, finds that there is a gigantic society, with vast capital, which purchases almost every fish caught on the British coasts. As it must maintain equal prices, and as fish come in very irregularly, it becomes necessary to destroy immense quantities. These might, indeed, be salted or given to the poor, but even this in the end would lead to a light loss. All fish are purchased at the seaside at a rate varying from one farthing to loss. All fish are purchased at the seaside at a rate varying from one farthing to three half-pence per pound. In London they are at once delivered to certain of these most decided protectionists, who are called Bummaries, and when finally they reach the retailer they are sold at six pence a pound. "Here then," says Mr. Leland, "by a flagrant abuse of protection, and in a country which glorifies itself as vindicating the right of every man to buy cheaply, we find, during a period of semi-famine among find, during a period of semi-famine among the poor, the price of a most essential article of food raised several hundred per cent., enormous quantities being in the meanwhile constantly destroyed that this extortion may

### Recent Tests of Steel for Shipbuilding.

A highly interesting report on some tests made with steel produced at the John Cockerill Works, at Seraing, Belgium, has been presented to Lloyd's Register, by J. Williamson, surveyer to Lloyd's. It appears that on a former occasion Mr. Williamson had made some tests at Seraing, and had submitted as the result that the material prossessed a want of uniformity in material possessed a want of uniformity in the ductility and elasticity of the material, which would not insure a uniform fulfillwhich would not insure a uniform fulfillment of Lloyd's requirements. He attributed these results to the use by the
Cockerill Company of spiegeleisen, and recommended the employment of ferromanganese. The Cockerill Company requested
that these first tests should be looked upon
in the light of preliminary trials. They
made further experiments, of which the report now before the public is the result.

For the purposes of the mechanical and
chemical tests, sample ingots from four different charges were selected, viz.: Numbers
8844, 6593, 6594, and 9461 respectively, and

8844, 6593, 6594, and 9461 respectively, and rolled into plates, angle irons, beams, bars, &c. The charge No. 9461 was selected as a sample of the material recommended by the Societé John Cockerill as being, in their opinion, very suitable for boiler-making purposes; and as it was known before testing it, that it would withstand a higher tensile strain than is at present admitted for shipbuilding purposes, the results of the tests of the said charge have been shown separately from the other three charges which were selected from the material made fulfill the committee's requirements for

A glance at the above results of the

A glance at the above results of the chemical analyses of the several samples, will show that the shipbuilding steel made at Seraing is as comparatively free of im-purities as either the English or Swedish

A number of samples of steel plates, se-lected from the above-mentioned charges, made by the Societé John Cockerill, were

made by the Société John Cockerill, were carefully prepared for the purpose of ascertaining the elastic and ultimate tensile strength of the material. Some of the samples were tested unannealed, and some after being annealed.

The mean ultimate strength of five unannealed samples lengthwise of the fiber was 28.1 tons per square inch of section, with a mean ultimate elongation of 24.4 per cent. on a length of 8 inches. These mean results quite fulfill the committee's requirements.

mean ultimate elongation of 24.4 per cent. on a length of 8 inches. These mean results quite fulfill the committee's requirements. But on looking more closely into the details, a want of uniformity in the results was observed. For instance, the ultimate tensile strength ranged from 24.5 to 35.3 tons per square inch of section, and the elongation from 18.8 per cent. to 27.6 per cent. on a length of 8 inches.

On the other hand, the results of the tests of the annealed plates were very satisfactory, both as regards the ultimate tensile strength and elasticity, as well as in the uniformity of those results in detail. The mean ultimate strength of six annealed samples lengthwise of the fiber was 29.6 tons per square inch of section, with a mean ultimate elongation of 22.07 per cent. on a length of 8 inches; while the ultimate tensile strength of six specimens varied only from 29.1 to 31.1 tons per square inch of section, and the elongation from 20.08 to 25.0 per cent.

The mean ultimate strength of six an-

25.0 per cent. The mean ultimate strength of six annealed samples crosswise of the fiber was 28.8 tons per square inch of section, with a mean ultimate elongation of 21.7 per cent. on a length of 8 inches. The ultimate ten-sile strength of these six specimens varied from 27.7 to 30.2 tons per square inch, and the elongation from 20 to 24 per cent. These results show the great importance of annealing after rolling, in order to insure uniformity in the character of the material before it leaves the maker's works, as from inquiries instituted after the above tests were made, it was ascertained that the want of uniformity shown by the unannealed plates arose entirely from their being allowed to cool in damp and exposed places after rolling. Experience has also shown how desirable it is to anneal steel plates after hammering or partial reheating at the after hammering or partial reheating at the shipbuilders' or boiler-makers' works.

satter hammering or partial reheating at the shipbuilders' or boiler-makers' works.

Another curious feature worth mentioning is that, while annealing made the material more uniform in quality, as might have been expected, it seems to have also had the effect of proportionately reducing its elasticity and raising its ultimate strength. In all other tests annealing has had exactly the contrary effect upon steel.

Attention should also be directed to the fact that the elastic stress borne by this material was unusually high, the unannealed plates having given a mean of 18.7 tons, and the annealed plates 20.8 tons per square inch of section. This quality would render the steel capable of withstanding comparatively high longitudinal strains, as well as impart a high percentage of local rigidity to a structure. to a structure.

### Cheap Gas.

NEW YORK, February 10, 1879. To the Editor of The Iron Age.—DEAR SIR:
The public are expecting that the electric light will soon reduce the present high price of coal gas, but as the general introduction of this system into dwellings, hotels and railway cars is still in the future, some attention which he given with advantage to way cars is still in the future, some attentention might be given with advantage to a cheap gas, which has been successfully introduced in Europe for lighting hotels, dwellings, railway cars, buoys, &c. This gas is made of fat, petroleum refuse, paraffine refuse, &c., and has a much greater value for America than for Europe, as in this country the price of coal gas is high and petroleum cheap, but in Europe gas is cheap and petroleum expensive. The gas is very rich, and an ordinary light consumes only about three-quarters of a cubic foot per hour, while coal gas must be burned from tips consuming 4 to 6 feet. If, therefore, the cost per light for coal gas is from 1 to 1¼ cents per hour, the cost of the oil gas is between ¼ and ½ cent per hour, supposing the gas to cost the same per 1000 cubic feet in each case.

Mr. Pintsch of Borlin is the inventor of

Mr. Pintsch, of Borlin, is the inventor of Mr. Finesch, of Borini, is the inventor of this new lighting system. The manufacture of oil gas is not new, however. It has been made for many years in this country and abroad, but the construction of Pintsch's abroad, but the construction of Pintsch's furnaces is new, and makes a fixed gas which cannot be condensed in the pipes nor suffer loss in volume from any cause. The introduction of Pintsch gas for large cities with an extensive underground pipe system, is not to be recommended, but for smaller towns it could be applied with great advan-

towns it could be applied with great advantage.

The cost of a gas works which would manufacture in 24 hours gas for one light for 12,000 hours, would be about \$15,000. The gas can be manufactured for about \$3.50 per 1000 feet, but 1000 feet of Pintsch gas possesses an illuminating power equal to 6000 feet of coal gas. The use of Pintsch gas in a compressed form is very extensive in Europe, and is especially adapted for lighting railroad cars, steamers, ferries, mines, streets, parks, and in buoys to mark the entrances of harbors and places difficult to navigate at night. It has been used with success for several years in Germany, Russuccess for several years in Germany, Russia and England, and there are now about sia and England, and there are now about 6000 cars of the principal European railways provided with Pintsch gas, the inventor having received different gold medals, the latest from the Society of Arts in London, in a railway lamp competition. In consequence, the Metropolitan Underground Railroad of London has adopted it for the whole line.

line.

The compressed gas is used in the following way: From the meter it passes into a small gasometer, which, in proportion to the production, requires only a capacity of from 1200 to 1800 cubic feet, as during the process of making the gas is compressed into holders, and so kept in stock for use in carriages, ships, lamp posts, &c. An iron cylinder about 6 feet long and 18 inches diameter, is large enough to contain compressed gas for 72 hours for one burner, under a pressure of 90 lbs. The gas passes from the cylinder to the burner through the regulator, which is the most important feature of the system. The construction of the regulator is peculiar. It consists of a cast iron conical vessel of about 12 inches diameter and 6 inches high, the upper part of which is closed by a gastight membrane. To the center of this is fastened a rod with movable joint, and this again is connected with a lever attached to a valve, and by means of this and springs, a perfectly even pressure at the burner is

a valve, and by means of this and springs, a perfectly even pressure at the burner is maintained under all circumstances.

The delicate action of the parts of the regulator gives a steady flame, which is never extinguished accidentally, either at sea or in railway coaches. The burner is a small fish-tail of steatite, and its form is such as to give a flame of the best shape.

The advantage of using the results come.

The advantage of using the gas in com-pressed form is, that it permits the distribumaintenance of mains and distributing systems. The gas is made at some convenient point, and the cylinders are there filled; or it may be pumped into suitably constructed vehicles, and thus carried to the cylinders, as in the case of house. vehicles, and thus carried to the cylinders, as in the case of buoys. At his works, near Berlin, the inventor gives employment to more than 1000 persons in manufacturing apparatus. The system is one which should be better known in this country, and should its introduction be effected, it will be attended with convenience and economy.

Yours, respectfully, ERNST SCHOENROCK.

Although manufacturing only for the short period of eight months, the Buffalo Forge Company, of Buffalo, have sold 500 forges and blacksmiths' blowers. Besides their large orders from New York, Boston and Philadelphia, large quantities have been sent to California and Canada. They have recently shipped goods to Cuba.

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Your Casters are a fraud upon all other casters, for when once a person has used yours all others are thrown aside. When our present large stock of other casters are exhausted we will give you a liberal order, for your goods are the best, strongest and most serviceable we have ever seen; in fact, they are perfect. We mean what we say.

DECOSTER & CLARK.

PHŒNIX CASTER CO., Indianapolis, Ind.

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# White Lead, Red Lead & Litharge.

## Dearborn's Pat. Adjustable Blind Awning Fixtures



Either old or new Blinds thus fitted can be opened in the usual way or used as an awning at pleasure.

For particulars address the sole manufac-

BOSTON BLOWER CO.,

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COVERT'S HORSE AND MULE JEWELRY. isting of Covert's Celebrated Harness Snaps, Swivel Snaps, Open Eye Bit and Chain Sn Thimble for Horse and Cattle Ties, Rope Goods consisting of Horse Ties, Cattle Ties ar is, Leather Horse Ties, Breast Chains, Halter Chains, Martingale Chains, Rein Chains, Pou-tage These goods are far superior to anything of the kind on the market. They I

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The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. We make more than 30 styles.

ALSO LANE'S PORTABLE COFFEE ROASTER Will roast 30 to 40 lbs. at once, and can be used as a stove at other times. Send for descriptive list to Manufacturers.

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Our agents, Graham & Haines, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at Fac-

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# THE "OLD RELIABLE" UNIVERSAL Clothes Wringer.



Improved with Rowell's Double oth ends of each roll.

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Pure White Lead, Red Lead, Litharge, Orange Mineral, Linseed Oil, AND PAINTERS' COLORS.

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Patent Iron Strapped Blocks. ROPE STRAPPED BLOCKS. 31 Peck Slip, New York.

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# AMERICAN SCREW CO.,

Providence, R. I.,

# MANUFACTURERS OF MORE THAN 4000 VARIETIES OF PRODUCT,

AND INCREASING THE ASSORTMENT DAILY.

Machinery employed contains important inventions recently patented, and which are designed to produce Screws at a lower cost to the consumer than has ever been attained.

All goods are distributed through the Hardware trade, to whom a liberal discount will be allowed.

(No. 235.)

## INTERNATIONAL EXHIBITION.

PHILADELPHIA, 1876.

The United States Centennial Commission has examined the report of the Judges, and accepted the following reasons, and decreed an award in conformity therewith.

Philadelphia, November 8, 1876.

REPORT ON Product: Iron, Brass and Steel Screws, Tire and Stove Bolts, Rivets.

Name and address of Exhibitor: American Screw Company, Providence, R. I.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for Award, for the following reasons, viz: Being of aquality nearly approaching perfection, showing the highest attainment in this branch of manufacture. G. L. REED. Signature of the Judge.

AWARDS.

Approval of Group Judges.

Daniel Steinmetz,

Section at Line E

J. Diffenbach, Dav. McHardy.

Jas. Bain,

Chas. Staples,
Chas. Staples,
A true copy of the record. Francis A. Walker, Chief of the Bureau of Awards.
Given by authority of the United States Centennial Commission.
A. T. Goshorn, Director-General.
J. R. Hawley, President. [L.S.] J. L. CAMPBELL, Secretary.

J. R. HAWLEY, President.







After forty years' experience we offer to the trade our Centennial Screws, patented May 30, 1876, as the best we have ever known.

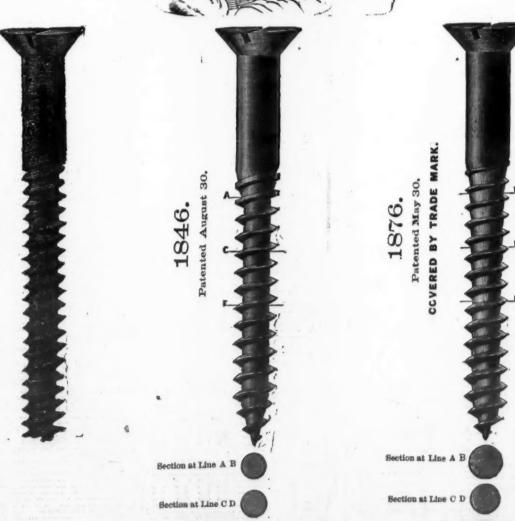
The method of manufacturing is also patented, and we are changing our machinery as fast as possible, to manufacture the improved article only. To introduce them, they will be sold at the same price as the old

The new screws will be packed in manila colored boxes with the new label covering end of box, and enlarged figures showing plainly con-

To distinguish this screw we have adopted a trade-mark, which is also secured to us.

The accompanying engravings show the progress of making screw from the old blunt point to, style now

Experience has shown that the wear point of screws, as formerly made, is at the heel of the thread, where all



Section at Line E F

the strains of forcing the screw into the wood naturally concentrate.

To avoid the sharp angle existing in the old style of screws has been the aim of all manufacturers, but every expedient hitherto adopted has proved as objectionable as the evil complained of.

It will be seen in our new screw that not only is the sharp angle avoided, but the strength very much increased, as illustrated. See sections at lines.

### CLAIM.

"A Pointed Wood Screw having the outer periphery of the thread upon its body cylindrical, while a portion of the body below the thread and near the neck is conical, the remainder of the body to the point being cylindrical, and yet having all the thread brought to an edge of a constant angle, without jogs in the paths between the threads, substantially as described."

# New York Wholesale Prices, February 12, 1879.

HARDWARE.	1
A naris.  Eagle Anvils (American)	0
	0
Augers and Bits. Conn. Valley Mfg. Co Douglass Mf . Co	1
Douglass Mf . Co.  Ives.  Beecher (French, Swift & Co)	•
Nobles Mfg. Co	
Cook's, Ives	6
B. Machine. dis 50	100
C.S. Hissell Jenning's Bits dis 49. Jenning's Bits dis 49. Dowel and Hags' Augers dis 18. Lowel and Hags' Augers dis 19. Keitorkto. Russell Jennings' Car and Machine Bits. Boring-Machine and Millwrignts' Augers. dis 28.028.028.02 dis 19. Machine and Millwrignts' Augers. dis 28.028.028.02 dis 19. Lowes' Jennings' Bits dis 20. Instation Jenning's Bits dis 20. Lowels' Single Twist Bits dis 40. Andrews Bits dis 50. Criswold's Patent Bits dis 50. Griswold's Patent Bits dis 50. Expansive Bits. Cart's small, \$18; large. \$26. dis 20. Expansive Bits. Cart's small, \$18; large. \$26. dis 20. Expansive Bits. Cart's small, \$18; large. \$26. dis 20. Expansive Bits. Cart's small, \$18; large. \$26. dis 20. Expansive French Swift & Co (dis 40. French Swift & Co	
Russell Jennings' Augersdis 16%&10&10&10 (Russell Jennings' Car and Machine Bits, Boring-	
Imitation Jenning's bits	6
Lewis' Single Twist Bitsdis 40  Andrews Bitsdis 50  Civiswald's Potent Bits	
Expansive Bits, Clark's, small, \$18; large, \$26.dis 20; ives	1
" Blake's \$20 and \$20 dis 40; " Parmelee's \$20 and \$20 dis 40; " French Swift & Co	6
French Swift & Co	6
" Stearns' Adjust., ? doz \$48—dis 25&10 9	
Gimlet Bits	
Double Cut Gimlet Pits Shepardson'sdis 40 dis 40	
Hartwell's	
Morse's Bit Stock Drill, List of May 15, 78dis 25 9	
Watrous Ship Augers	
Sewing, Brass Ferrule\$3.50 W gross—dis 40&10 Prg350 Gis 40&10 9	
1 tent sewing, snort	
Awis, Brad Sets, &c.	1
Awis Sewing, Common # gross \$1.35—dis 25  Sewing, Best # gross 1.40—dis 10 ft  Shouldered Peg # gross 2.26—dis 10 ft	1
Patent Peg	1
### Handled Scratch	
Brad Sets, Alken's	1
L'Hommedieu's Snip Augers	1
M. H. Jones & Co\$8.00 \$3.50 \$9.00 \$\mathbb{P}\$ doz net.	1
Axles. Common (Guy C. Hotchkiss, Field & Co.)? 5 3 3 5 6 8 8 1 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2	1
Dallaces.	. 11
Heilis	1
" Extra Heavy	1
" Swiss	1
Gong, Abbe's	1
Crank, Taylor's	1
" Connel's	1
Taylor's Bronze or Plated Lever	1
Hart, Bliven & Mead Mfg. Codls so&ro&2 %	1.
" Western	
Cow, Common Wrought	1
" Kentucky "Star"	1
"Dodge's Genuine Kentucky, new list— Nos. o 1 1/2 2 3 4 5 6 Hog 2 dis	1
Gong, Abbe's	1
Believs.  Blacksmiths'. Common	1
Hellaws, Common dia 45 5 Biacksmittis, Common dia 45 5 Moulders, Extra and Pitiaburgh Pattern dia 20 5 Hand Bellows, dia 25 Hand Bellows, dia 20 5 Selting, Rubber, dis 20 5	1
V Belting and Packing Co. Fine Para (Best) to	
y V Polting and Packing Co. Standard to 36	
Hit Holders. Extension, Barber's	8
Mit fielders	1
Blind Adjusters.—Domestic* doz \$3.00, dis 20 % Blind Fasteners.—Mackrell's	E
Van Sand's	1
Merriman'snew list net	8
Blind Staples. Boardman's Paton, 1/2 in and larger. Fig. net 4/2 in. Fig. 1/2 in. Fig. 1/2 in. Blecks.—Burr & Co. dis 2/5 bliverential Pulley Blocks. Fig. 1/2 in. Penfield Block Works, Rope and fron Strap'd. dis 2/5 """ Wrot. Fon Com. busined dis 2/5 all feel roll Fr. 1/2 in. Shea yes all feel roll Fr. 1/2 in. Shea yes all feel roll Fr. 1/2 in. Shea yes R. E. Co. Rope and fron Strap'd. dis 3/5 Stopley P. & L. Co. Rope and fron Strap'd. dis 3/5/5	1
Differential Pulley Blocks	E
Wrot. Iron Com. bushed.dis 30 %	000
buttery at the an observation of the	È
Beille. Cast Iron Barrel, Shutter, &c	1
Wrought Iron Barrel	CEN
" Shutter (Stanley's list)	1
" Stanley'sdis 25&10 % B.K.Flush, Com'n, Stanley'sdis 50&7½%	ELG
" Plated Knob & Slide Flush " dis 50&10 % Carriage and Tire, Common	CI
" Norway Iron	L
Coleman	200
Tire. Am. Screw Co.'s, Phila	F
Stove—American Screw Co.'sdis 55&5 @ 60 x  R. B. & W	100
Piow	2
Boring Buchines. Upright, Angular.	M
First quality, no Augers\$5.50 \$7.50 dis 40&10 \$ 11.00 dis 40&10 \$	AH
Bush's Lover and Châin Bolts. dis 40, 10810 3 Wrought Iron Barrel. dis 6ck 10 4 16 6ck 10 5 "Square dis 6ck 10 4 16 16 16 16 16 16 16 16 16 16 16 16 16	NE
Snell's, no Augers	LB
Bow Pins.  Botchkiss* Humson, Beckley & Co.'slow list dis 10 % Humson, Beckley & Co.'sdis 60 % Bargeat & Co.'s810,70 and £21,40, dis 60&10 %	T
Sarrest & Co 's Storo and £21.5c. dis cokto is it races.—Harter's Patent dis cokto is S. Backus.  O.S. Common Sarrest dis cokto is sold in the sarrest dis cokto is sold in the sarrest section.  O.S. Barackets.—Sacif (Sargent's). dis cokto is sold in the sarrest section.  Barackets.—Sacif (Sargent's). dis cokto is sold in the sarrest with sarrest section.  Barackets.—Sacif (Sargent's). dis cokto is sarrest with sarrest section.  Barackets.  Barackets.  Sargent's.  Old Sold Sold Sold Sold Sold Sold Sold So	G
Wilson afg. Co. dis 10 % Spontoid's Patent. dis 50 % 5 %	
Noble sPatent	
Brackets.—Snelf (Sargent's). dis tog to @ footion to swing (T.& S. M. P. Co.)	P
Briefi Rings.—Union Nut Co	1
Notchkiss' low list dis to 5 diumason Beekley & Co.'s. low list dis to 5 dis 60 5	Si
Butts. Wrought Brass	1
Hatts. Wrought Brass	SSP
" Broad	BC
Loose Toint, Narrow and Broad dis rokyof	200
Postioment Rutts dis	R
Parijament Buttsdis Mayer's Hinges	R
Partiance Butts dis Mayor's Hinges dis Mayor's Hinges dis Fast Joint, Narrow dis 568:10 5 Proad dis 568:10 5	RCOMNB
Partiance Butts dis Mayor's Hinges dis Mayor's Hinges dis Fast Joint, Narrow dis 568:10 5 Proad dis 568:10 5	RCOME
Fast Joint, Narrow and Japanned dis 56k10 5 Broad, Japanned dis 56k10 5 Broad Japanned dis 56k10 5	RCOMNB

	w York Whol	
	Union Mfg. Co.'s Fancy Butts— Heured Enameled Loose Joint. dis 6ckro 9 soton Finish, Plain. dis 8ckro 19 soton Finish, Plain. dis 8ckro 19 with Fron Acorns dis 7ckro 16 7ckro	Brea
-	with Iron Acorns dis 75&10 with Silvered Acorns dis 75&10 who Silvered Acorns dis 75&10 who Unit of the Wast Joint Narrow dis 45 Lt. Narrow dis 45 di	Whi
	Loose Joint. Broad   Gis 50 2     Table Butts. Back Flaps. &c.   Gis 45     Inside Blind. Regular   Gis 50 2     Clight   Gis 60 3     Clight   Gis 60 3	Auto Dr Dant
	Loose Pin, Wrt. dis 55 Spring Hinges: American Spiral Spring Butt Co., Jap'd. dis 25 American Spiral Spring Butt Co., Jap'd. dis 25 Fancy. dis 25 Geor's Single and Double Acting. dis 25	Family Nation
	Sabin Mfg. Co.'s Double Acting	Mill :
	Union Mfg. Co. dis 24; Bommer's dis 25; Blind Butts, Parker. dis 24, Falmer dis 408;5810	Genu
	Seymour   dis octrosico	Wasi Well Ham
	Inside Blind, Regular	B. & En Kettl Sauce
	"  Butcheres' Cleavers.  Humason & Beckley Mfg. 60. dls 20 9  O. R. Barton Tool Co. dls 20 9  Bradley's. dls 24 9  Beatty's. dls 24 9  Beatty's. 3 4 5 6  Bradley Co. dls 20 9	Tinne Esc Iron. Brass
	Hart Mrg. Co	Par Fre
	American.	Fenn Star. Frary Wood West
	Ro. 5, 1701 Handle  Eureka	Meta Cork Enter
-	#20.00 26.00 26.50 35.00 \$7.00 4150 45.00  (Inn Openers.	Amer Aubu Arcac G. & I Nicho
	F. L	Helle Madd Jowit J. & F
	Cartridges.—Metallic	Stubs Butch Walte Fishe Moss
	Carpet Stretchers. Cast Steel, Polished	Limet
	Casters   Cast	Peerl Eagle
	Humason, Beckley & Co.'s	Crow Star. Crow
	German Halter Chain	Bome General Shep
	Red # gross 75c net	For
-	White Crayons # gross 14%c net Chiseises D. R. Barton Tool Co. (all kinds)	France
	"   Merrill   dis 70 % "   Witherby Tool Co   dis 70 % "   Douglass'   dis 70 % "   Firmers, Crossman   dis 64k10 % "   Buck Bros   new list, dis 24%	Burni No do: Acme
	White Crayons .	Wire.
	" Spear & Jackson's 5.00 to & Buck Bros (Shank) 5.00 to & Clamps,	Mail a
	# Snow's	Doubl
	"Cabinet, Sargent'sdis controlled  'Carriage Makers', Sargent'sdis 65%controlled  'Cord and Tape (T. & S. Mfg. Co.)dis 30 %  Clips, Axle.  Norway or Bestdis 60	Tinne Famil
	Superior	Headi Hadi
	Plain Bibbs, "	Chene H. Ha Verre Magne Warn
	Cabinet, Sargent's dis 66 16210 5 Carriage Makers', Sargent's dis 66 16210 5 Carriage Makers', Sargent's dis 66 16210 5 College, Arle dis 50 5 College, Arle dis 50 5 College, Arle dis 68 162 6 Sorway or Best dis 66 162 6 Cockeyes 14 in., 26c; 1½ inch, 33c; 1½ in., 37c, ne Cocks, Hraas. tacking, new list dis 50 5 Globe, dis 50 5 Plain Bibbs, dis 50 5 Plain Bibbs, dis 50 5 Plain Bibbs, dis 50 5 Coffee Mills. Board and Box dis 20025, 5 Increase Wilson's dis 20 5 Coffee Mills dis 20 5 Coffee Mills dis 20 5 Compasses, Dividers dis 20 5 Tombit Los Bros dis 20 5 Compasses, Dividers dis 42 6 Compasses, Callipers dis 42 6 Compasses, Calliper	Han Provide Tower
	B r doz \$15.00	Nos. Per Roggi
	Bemis & Call Co.'s Dividers	Brons Jap'd no F Barn l Wrou
	Cook's	Surfac Flush Lifting Saw as Hamn
	D k. Barton Tool Co	Brad A Hickon
	Iron, Steel Points. \$\tilde{V}\$ b 50 C Crucibles.—Gautier & Co. \$\tilde{V}\$ No. 554c Curling Irons. & Co. \$\tilde{V}\$ No. 554c Curling Irons. & Co. \$\tilde{V}\$ No. 200, 2.40. \$\tilde{V}\$ dos \$\tilde{V}\$ of the 50 Curling Irons. \$\tilde{V}\$ dos \$\tilde{V}\$ of the 50 Curling Irons.	File, a
	Pinching Irons. # dos 7.50, dis 20 \$  Curry Combs. # dos 7.50, dis 20 \$  Curry Combs. dis 45 \$  Hotchkins & Kellogg's, Iron & Brass, old list.dis4. #74 \$  Hotchkins Novelty	Har Barn l Novelt
	Bubber	Challe Clima: Sterlin Cherit
ľ	Naugatuck Cutlery Co list net	Fitch's Hotch
	Embossed Gift	
-	Torrey's Rou.	
	Challenge (Coll)— Nos. 9 7 6  Japanned. # dos \$2.00 2.50 3.50  Coppered. # dos \$4.00 4.50  Galvanized. # dos 3.50 4.00 4.50  Nickeled. # dos 3.50 4.00 4.50	Shing Claw Lath Hurd's Shing
	Premium (Coil)— Nos. 1 2 3  Japanned. # doz #7,50 6.25 5.00 dis 30 %  Nickeled. b doz 11.00 5.0 8.00 dis 30 %  Star (Coil)—For Cop'd, Nickel-Plated, &c., see list,  No. 4. "Shoo Fiv" (Sersen dozarise & doz.	Claw Lath: Simmo Shin; Claw
-	No. 5, Screen Door Size # doz \$2.00 No. 6, Medium # doz 2.50 No. 7, Larye. # doz 3.50 Sabin's Lever. No. 1, \$1; 2, \$1.50; 3, \$2; 4, \$2.50; dis 30 %	Claw Lath Broa Collins Shin
-	Gray's "	Claw Lath D. R. B Shing Lath,
-	D, R. Barton Tool Co. dis 20 \$	Bhing Claw Half.
4	Adjustable Handiedis 20 %	Lath, Hunt M. H. J Shing Half

-	esale filles,	Г
*	Breast, Wilson'sdis "Miller's Faliseach \$2.50, dis	20 %
N.W.M.	Breast, Wilson's dia Miller's Falls each \$2.00, dis Ratchet, Merrill's (dis Acceptable of the Merrill's (dis Merrill's dis Merrill's Merrill's dis Merrill's M	25 % 35 % 30 % 20 %
74 75 75 75 75 75 75 75 75 75 75 75 75 75	" Weston's. dia  " Moore's Triple Action. dis 26  Whitney's Hand Drill. dis 206  Whitney's Drill Stocks. dis  Automatic Boring Tools. each \$2.75, dis	35 % 10 % 10 %
* * * *	Whitney's Hand Drill dis 208 Wilson's Prill Stocks dis Automatic Boring Tools each \$2.75, dis O'rill Chucks.—Morso's Beaon Patent.—dis Danbury.————————————————————————————————————	30 % 30 % 30 %
XX	Danbury	20 % net
MMMM	Klevater Buckets, 3½ to 10 in., (Duc's Improvaled Buckets, light, 3½ to 10 in., (Duc's Improvaled Buckets, heavy, 5 to 10 inches (Duc's Improvaled Buckets, heavy, 5 to 10 inches (Duc's Improvaled Buckets)	
N. W. W.	# dox \$5.60 @ \$10.20, Storehouse, (Duc's Patent) 12 to 17, \$12.00 @ \$20.00, Emery and Emery Paper.	net
***	Storehouse, (Duc's Patent) 12 to 17, \$12.00 @ \$0.00   Emery and Emery Paper.   Gentine Chester-Regular Nos   \$1.00	tra te 8e
	Flour	net net
200	Enameled and Planted Ware	
	Sauce Pans. dis Tinned Sauce Pans. dis Excutche on Pins.	35 %
6	Iron dis 33 Brass. dis 53 Recutcheous. Same discounts as Door Lock Srass Thread discounts as Door Lock Wood dis Tanucets.	io %
2000	Fenn's Cork Stops disa Star dis 55tar dis 55tar dis 55tar dis 55tar dis 2081 Frary's Patent Petroleum dis 2081	0 %
2000	Wood and Metallic dis, West's Patent Key. dis, Metallic Key, Leatner Lined. dis yok: Cork Lined. dis yok: Enterprise (Self Measuring). ♥ doz, \$30.00, dis; Fellee Plates. ♥ \$150, dis;	0 % 0 % 0 %
	Enterprise (Self Measuring)	10 % 10 %
	American File Co	55
	Heller & Bros	55 55 55 55 55
	### ##################################	200
	Fisher's	20
	Dissoon & Sons (new list)	net net
	300 each 1 Peerless, 4-inch Rolls 4.00 each 1 4.75 each 1 Eagle, 34-inch Roll \$1.024 each 1 Eagle, 34-inch Roll \$2.124 each 1	
-	Eagie, 34-înch Roll. \$1.02/c each i	et 5%
	Star 4½ in., \$3.50; 6 in., \$4.00 each r Crown Jewel 0 in., \$2.50 each r Domestic Fluter 1.50 each r	et let
		o %
	Shepard Hand Fluter	0%
	Fitting Scissors. dis 42k: Ferkis. Hay. Manure and Sp. ding new list. dis r Patted A. Rogers & Fro dis 40k5 % ca Frest and Jelly Fresses. Enterprise Mig. Co dis 2 Fry Pana.	5 %
	Enterprise Mfg. Co	70
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	Harking, Stanley's dis solution of the Chapin's dis solution of the Star dis solution of the Chapin's dis solution of the Star dis solution of the Chapin's distribution of the Chapin's distr	× ×
	Wire. dis 1:  "Smith's Patent. # doz \$18.00, dis 4: Gimlets. Nail and Spike. dis 4:	N N
	"Smith's Patent.	XXX
	" Ives'. dis 5	*
1	Glue Petsameled dia 4 Tinned and Enameled dia 4 Family, Howe's "Eureka" dia 3 Grindstone Fixtures. dis 7 Grindstone Fixtures. dis 7 Sargent's Patent dis 40 Eading Hardware Co	*
1	Sargent's Patent	MAN
1	Cheney's, List January, '79dis 20	2
1	12	MAN
1	Hand Cuffs and Leg Irons, Providence Tool Co.'s Hand Cuffs, \$15.00 \( \psi \) dox  Leg Irons, \$25 \( \psi \) doz \( \delta \) dis 10  Tower's dis 25	×
	Tower's	*
1	Hoggin 1 laters per doz 30 @ 33c n. Bronzed Irop Drop Latches	et et
	Barn Door per dos \$co, dis 6,2 noê noê wrought Chest. dis 602 22 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	***
	Flush Chest	AMMA
1	Hickory Firmer Chisel, assorted, # gross \$4.50   large, # 5.00   assorted, # 5.00	
1	Flush Chest	×
1	Apple " assorted, " 5.00  Socket " large, " 6.00  Socket " assorted, " 3.00  Framing " assorted, " 5.00  Jekin Framing " assorted, " 5.00  Large, saorted, " 5.00  Large, socket " 6.00  Patent Auger, vee" 7.00  Patent Auger, vee" 8.01  Swah's. # set \$1.25, dis 20&10  Hancers.	KX
1 2	Hangers. F set \$1, dis 20&10 Hangers. dis 70&10 @ 70&10 @ 70&10 @ 70&10	N N
0000	Hangers.  Barn Door.  dis 70&10 @ 70&20 @ 70&10 @ 70&10 @ 70&10 @ 70&10 @ 70&10 @ 70&10 @ 70&10 & 70&10&10 & 70&10&10 & 70&10&10&10&10&10&10&10&10&10&10&10&10&10	NAMA.
lı	Harness Buaps.  Henshaw's List of 1½ changed to \$14.00, dis 57 dis 55 (fitch's (Bristo)) 14.00, dis 55 dis 50 dis 55 dis 50 d	8
Ιī	Hotelsking!	8 1
2000	dis to   d	
ľ	Shingling, Nos. 1 2 3. W dos \$7.25 \$6.00 \$8.75 Claw, Nos. 1 2 3. W dos 7.75 8.00 \$2.5 Lathing. Nos. 1 2 3. W dos 7.50 8.00 \$5.00	
	Shingling, Nos. 1 2 3, # dox \$7.25 \$8.50 \$0.75 \$1.00 \$1.25 \$2.50 \$	
E	Lathing, Nos. 1 2 3	% I
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I	Ulaw NOB. 1 2 3 \$\frac{1}{2}\$ dos 0.50 7.00 7.50 1.8. Barron Tool Co. (Solid Seee)	9
	Bhingling, Nos. 1 2 3 dos \$8.50 \$8.00 \$7.50 Claw, Nos. 1 2 3 dos 0.50 0.00 8.50 Half. Nos. 1 2 3 dos 8.50 8.00 7.50	OH I
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200	66	Common	Sense.		No. 25 1	dog &	dis tok	10 %
o %	Rolled	Shepard Blind H Plate	********				dis for	0 %
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et d)	Screw	Hook as Welded	{ over	10 in	10, 12 1 to 36 11	n., 110	dis 50&1	0 %
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8c 40	Hee Socket	d Shank	Shank,	C. B.	12 in.	dos	-75, dis 1	18
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×	Bench-	-Hotchk Weston	iss', \$5.00	#10.00	, No. 2,	<b>8</b> 9.00 ₩	dos dis 2	SAN S
*	Clothe	(Humas new list) -Hotchk Weston McGill' Skinnes Line, H	rs, 86,25 art's list	per do	Ø	dis 60	dis 10 dis 20 &10&5&10	0%
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6	Shutter.	Sargent, Porcela	in			d	is coero	XXX
1	and Men	Sa	rgent's			d	is socio	3
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2	Tubular Hurrica	ne		With	lio,co; Guards	No. 1, 8	ira. ; ne	t
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1	Round Flat K	Key	ane's Lis	t Jan.	1, '77-	dis	8 40&10 5	
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30 5	TAR Men Co
	Porcelain Head, Sargent's Listdis 50&10&10 g  "Judd's List
35 5	Pinking Irons
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36 9 35 9 30 5 35 9	Planes and Plane 1 rens.  Bench, First Quality
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10 18e	Fletcher Post Hole Augers P dos 36.00, dis 20 5 Vaughan's Post Hole—
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February 13, 1879.	
Leach's	Pro
No. 0, \$8.00; No. 1, \$15.00, dis 15 S	V
Plate and Cross Cut	Joi Per Ap
Alken's Genuine	Pr
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Turnbuil's Market dis 20 & 5 Fairbanks' dis 20 & 5 S W.we's dis 20 & 5 S	
Chatillon's Grocers' dis 40 % Eureka dis 20 % Family Universal. dis 25 %	Con Gai
Favorite dis 25 % Turnbull's dis 25 % Scale Beams, Chatilion's list dis 25 %	Car
Serapers.  Migrapers.  Migrape	Gal
Herapers. Adjustable Box Scraper (S. R. & L. Co.), \$6. so.dis se&to 5 Box, 1 Handle # dur #g.co, dis 10 \$ Box, 1 Handle # dur #g.co, dis 10 \$ Box, 1 Handle # dur #g.co, dis 10 \$ Box, 1 Handle # dis 2 \$ Box, 1 Handle # dis 2 \$ Box, 1 Handle # dis 2 \$ Box # dis 5 \$	Fer
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Disston's Patent Excelsion dis 52% 8 Disston's Patent Excelsion dis 25% 8 Buck Bros. I Level Com. Varnished Hols. dis 26% 9570 8	Am
Sargent & Co. s	Col
Screws. dis 60 % Flat H'd Iron. dis 60 % Round Head Iron. dis 15 %	Gir
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Bed Machine, Flat Head, Iron, Am. Screw Co. dis 25 7 Round Head, Iron, Grew Co. dis 26 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Ail
Bench. Iron. Wood, Beach. # dos \$2.00, net Hickory. dis 2020 5	Un
Hand Rail, Sargent's dis 60210 %  " Humason, Beckley & Co.'s dis 40210 %	Cro
Jack (Wilson's). dis 35 % Sash (T. & S. Mfg. Co.). dis 25 % dis 25	Eu
Cast Steel	Ex
Scissors	Ke
Sash(T. & S. Mfg. Co	Pee
Sheaves. Sliding Door, M. W. & Co., list	
" R. H. S.  Sheaves, M. W. & Co., list dis 35,810 & 2, 5  " R. & E. list dis 50,82 \$  " Patent Roller dis 48,82 \$  " Hatfield's dis 50,82 \$  " Hatfield's dis 50,82 \$  " Hoore's Anti-Friction dis 50,82 \$  Sliding Shutter, R. & E. list dis 50,82 \$  Moore's Anti-Friction dis 40,82 \$  " Sargent's list dis 50,82 \$  Moore's Anti-Friction (Hanging) dis 45,87 \$  Philadelphia Hanging dis 43,8 \$  Shevels and Spades	Col
Moore's Anti-Friction. dis 45 % Sliding Shutter, R. & E. list. dis 50 82 8	Sta
Moore's Anti-Friction (Hanging) dis 4 % Philadelphia Hanging dis 40% 5&2 %	110
Philadelphia Hangins	I H
Gid Colony	Pi
B. Rowland's Regular, new list	Pi
Oxford Patent, new 188	E
Polished Steel, new list, dis 50&10&2 %	R
Less than a casedis 65&10 \$	80
Spake Shayes.         new list, dis 25&10 \$           Defiance Metallic.         new list, dis 25&10 \$           Iron.         dis 40&10 \$           Wood.         dis 20 \$	Co
Wood. dis 30 % Bailey's (Stanley R & L. Co.) new list. dis 20 % Spake Trimmers.	Re
Spoke Trimmers. Bonney's.  \$\text{P} \text{doz} \text{\$\frac{\pi}{2}\$ doz} \text{\$\frac{\pi}{2}\$ c.co, dis \$\pi\$ \$\text{\$\frac{\pi}{2}\$} \text{\$\frac{\pi}{2}\$ doz} \text{\$\frac{\pi}{2}\$ c.co, dis \$\pi\$ toz \$\text{\$\pi}\$ doz \$\text{\$\pi}\$ c.co, dis \$\pi\$ toz \$\text{\$\pi}\$ doz \$\text{\$\pi}\$ c.co, dis \$\pi\$ toz \$\text{\$\pi}\$ doz \$\text{\$\pi}\$ c.co, dis \$\pi\$ toz \$\pi\$ c.co, dis \$\pi\$ toz \$\text{\$\pi}\$ c.co, dis \$\pi\$ t	I I
Speans. F dos \$0.00, dis 20x10 3 Tinned Iron dis 15 5 Rasting.	Ro Bai Sw
Britannia. dis 50% of 10% of 1	SW
Boartman   Sous, A     dis 40% 5 % cs. 5	An
Hadi & Eston dis 40% 5 % Holmes, Booth & Haydens	Bri
Tin (P. S. & W.), Teas. \$1.50 \( \text{\$\text{\$\sigma}\$} \) gross, net	Bri Bri
Douglass	Cir
Highting "Screw Platsdis. to \$ Stone	Seg Loc She Bo
Ax Stone	Bol Coj
Sips	to d
Arkansas Stone No. 1, W h \$1.00 No. 1, W h \$0.85	IAX F
Turkey Oil Stone (Boyd & Chr.sc)4 to Sin, \$1.00 \( \psi \) b,  "Slips "  Slips "	14 8
Lake Superior (Boyd & Chase)	24 5
Stave Polish   Stave Polish   Stave Polish	14 8
Gold Medal. # gross \$4.50, dis 5 % "Mirror" # gross \$6.00, dis 5 % Ruhy # gross \$6.00, dis 5 %	12 (
Rising Sun # gross \$3.75, net Squares.	No
steel	
rry Squares and T Bevets	Ga
Rising Sun.  Squares.  Seel	Pa
List of May, 1878	Ru
Double-Pointed Tacks. dis 40£5 % Tap Borers. dis 20£10 % Town Borers. dis 20£10 % Twes Tap Borers. dis 20£10 % Enterprise MFg. Co. dis 20 % Tapes, Measuring.	Br
American deasuring.	tit
Tapes,   Measuring	All
Tin Case. dis 70 %  Tobacce Eutters, dis 70 %  Enterprise Mfz. Co. (Champion)	All
Tobacce Cutters. Enterprise Mfg. Co. (Champion)	3 160 All
Toe Calks,—Winsted	SB
	Sh
Traps.   dis 1/820	Cia
" Round Wire \$\pi\$ dox holes, 12 \( \tilde{\text{0}} \) \$\text{63} (3c) \$\text{63}\$ (2c) \$\text{63}\$ (3c) \$\text{63}\$ (3c) \$\text{63}\$ (4c) \$\text{63}\$ (4c) \$\text{63}\$ (4c) \$\text{64}\$ (4c)	
Rat. "Decay"	1
Trewels. Lothrops Brick and Plastering	Pl
Trewels. Decay per dos \$10.00, dis 10 % Trewels. Lothrops Brick and Plastering. dis 15 @ 20% Read's Brick and Plastering. dis 15 % Disston's Brick and Plastering dis 20 % Pasco's Plastering dis 20 % Clement & Maynard's. dis 20 % Rose's Brick. dis 15 % Rades' Brick. dis 15 % Grarla's Brick and Plastering. dis 20 % Grarla's Brick and Plastering. dis 20 % Garden. dis 50 % Garden. dis 50 %	Me
Rose's Brick dis 20 % Brades' Brick dis 12 % Worrall's Bed 20 %	Me
Garden dis 20 %	Me
Triers. dis 50 % Butter and Cheese. dis 25 % Solid Box, Trenson, Now Market	Me
Wilsons New List, Jan. 22, '79, dis 35 \$  Wilsons New List, Jan. 22, '79, dis 35 \$  "Crown" (A. H. Hiddie's) 40 50, too lbs.	AE 7
" Park, Long & Co., new list Jan. 22, 79.dis 35 S Parallel Proter Wrights	4
Wilson's dis 20 5  Howard's dis 45 @ 50 5	10 15 18
Merrill'sdis 26 %	m
" Trentondis 60&10 %	-
Sargenvs.   dis 60&10 %	12 56,
"Trenton dis 25	500 500
Butter and Cheese	
"Trenton. dis 25 %  Backus and Union dis 25 %  Backus and Union dis 25 %  Flaher & Norris dis 15 %  Flaher & Norris dis 15 %  Flaher & Norris dis 25 %  Flamily, List. dis 25 %  Family, List. net  Stearn's dis 28 %  Here and Anvill dis 25 %  dis 28 %  List. dis 28 %  Lis	12 96, 506 12 810 No

T	HE IRON AGE
Ventilators.	No.21 41 8.34 .B'
Ventilators. rotective (upper) per foot, \$1.00	No.32 41 34 12 32 32 32 35 42 32 35 42 32 35 42 32 35 42 32 35 42 32 32 32 32 32 32 32 32 32 32 32 32 32
Smith's Patent # dos \$12.00 dis 10 5	NO.25
hhnon's   P de Silco dis socio   penny's   P de Silco dis socio   penny   P de Silco   penny   P de	No.26. 40 44 50 No.27. 43 No.28. 45 No.27. 45 No.28. 47 51 55 No.28. 47 No.29. 46 No.20. 47 No.20. 47 No.20. 47 No.20. 47 No.20. 47 No.20. 55 No.21. 57 No.22. 55 No.2
Weather Strips.  rotective Ventilator Co. s	No.20
Wire. Revised listdis 60&10	No.32
rass and Copper List of July 1, 1878 dis 10&10 % right and Annealed Nos. 0 @ 18. dis 50 @ 57% \$	No u
NOS. 19 @ 20, d18 00 @ 02% \$ NOS. 27 @ 30, d18 65 @ 07% \$ NOS. 0 @ 18 d18 50 @ 55 \$	Flat, Square and Half Round Wire & * advance on Round Wire.  Fancy Wire not less than 100 * advance of Round
alvanized, Nos. o to 6	Brass Rods, No. 8 and larger not less than 2 feet
inned, Nos. o to 18dis 42% 6 47% 8 ast Steeldis 25 6 30 8	tengths, 33c. Wire straightened and cut, smaller than No. 8, and not less than 2 feet lengths, 48c.
nnealed Fence, Pos. 8 and 9	Wire and Rods less than 2 feet lengths, special rates.  Twelve cents per a cytra few specific controls.
alvanized Telegruph, Nos. 7 to 9	wire straightened and cut, smaller than No. 8, and not less than 2 feet lengths, scc. Wire and Rods less than 2 feet lengths, special rates. Twelve cents per 8 extra for spooling on 1 B spools. Common Plain Breat-Laxoous.  Common Plain Breat Pail Ears
ence Staples	Brass Door Rail
tyba Steel Wire\$7.00 to £ gold apanned Barb Fence.	Low 130 Gilding 130
alvanized "Brian Misse Wire, Nos. 12 to 27 # \$ \$1.00, net	Gilding. 130 Gilding. 140 Turnings, Filings and Chips half the price of Scrap. Terms—Not cash. Interest to be added after thirty days.
Idd's Picture Wire.	Plain to No. 20 inclusive, above 14 in. to 3 in
merican Adjustable	* above 31n
Diagonal	Nos. 24, 25, 26, four cents advance on List for each Number.
" Pattern (Wrought)	Number. Above No. 26, special rates. Plain, 4 inch
irard	3-16 "
avis' Patent Duplexnew list, dis 25 6	All Mandrel Drawn Tubes, 5 cents advance on List Prices.
" Merrick's Pattern dis 40&5 % " Briggs' Pattern dis 35 %	Fancy Tubing to No. 20. 45c English, Scotch and Extra Patterns Fancy Tubing to No. 20. 50
Cylinder or Gas Pipedis 25&30 % iken Pocket (Bright)	to No. 20. Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List. Add to 2 cents % cent for each additional cutting
Wringers. Per dos. No. 24. Per dos. 860.00	Add to 2 cents 34 cent for each additional cutting under 2 feet. All Mandrei Drawn Tubes under 34 in., 25 cents per
" No. 1/2 71.00	pound advance.  ZINC TUBING.—net.
" NO. 21/2	Plain
ureks, No. 1	A Per cent
xcelslor, No. A, with Folding Bench	6 "
eystone No. 1, Wood Frame, no Gear. 54.00	15 "
No. 10. Wood "Common Gear 60.00 berless, No. 0, no Cogs	All Mandrel Drawn Tubes under 36 in., 25 cents per pound advance.  Plain. 22 Fancy 36 Scotch and Extra Patterns. 31  4 Per cent. 32  4 Per cent. 35  5
" No. 2½, with Cogs. 54.00 " No. 2. 60.00	Valued at 7 cents ₩ b., or under, 24/4 cents; over, 7
" No. 3, " 71.00 No. 4, " 71.00	# B, and to % ad val. Railway Bars, 1% cents # B. Railway Bars, in part Steel, 1 cent # B. Provided.
Stamped Tinware.—New List Dec. 1, 1878. ommon Stamped Ware	that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or
	description, shall be classed as American Cast Steel.
METALS.	Tool. 15c Spring 70 Homogeneous 12260
HONDuty: Bars, 1 to 11/2c. W B; Sheet, Band	
RON.—DUTY: Mars, 1 to 1½c. # B; Sheet, Band Moop and Scroll, 1½ to 1½c. # B; provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Fig. #y # ton; Polished Sheet, 3c. W Wrought Scrap, &# ton; Cast Scrap, &# per ton; Ballford not #1 co Bs. Boller and Plate, 1½c. # B.</th><td>File</td></tr><tr><th>Wrought Scrap, \$8 \$\ ton: Cast Scrap, \$6 per ton. Railroad 70c. \$\ 100 \text{ bs. Boiler and Plate, 1\frac{1}{2}c. \$\text{ b.}.</th><td>  File</td></tr><tr><th>                                     </th><td>Chrome Steel.</td></tr><tr><th>Gray Forge</th><td>Tool, extra fine</td></tr><tr><th>Eglinton</th><td>Machinery</td></tr><tr><th>  Rilbs                                      </th><td>English Steel</td></tr><tr><th>Old Rails</th><td>** Round Machinery, Cast</td></tr><tr><th>Wrought Scrap, from yard \$\Pi\$ ton. nom. 21.00 \$\Theta\$ 22.00 ommon Iron:</th><td>Blister, 1st quality</td></tr><tr><th>ommon from: § to 2 in. round and square</th><td>" 2d quality # 100</td></tr><tr><th>efined Iron: % to 2 in. round and square</th><td>Sheet Cast Steel, 1st quality. # B 15%c 2d quality. # B 14%c</td></tr><tr><th>efined from:  \$\fomale \text{ to 1 in. \cdots } \text{ \$\psi\$ to 2 in. \cdots } \text{ \$\psi\$ to 2 in. \cdots } \text{ \$\psi\$ to 1 in. \cdots } \text{ \$\psi\$ to 2 in. \cdots } \text{ \$\psi\$ to 2 in. \cdots } \text{ \$\psi\$ to 2 in. \cdots } \text{ \$\psi\$ \$\psi\$ 2 in. \cdots } \text{ \$\psi\$ 2 in. \cdots }  \$\psi\$ 2</th><td>  Country   Coun</td></tr><tr><th>TO COLUMN AS ONE .</th><td>Pipe and Sheet, 24c # B.</td></tr><tr><th>Ordinary sizes</th><td>American</td></tr><tr><th>per, 4c w m; manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.</th><td>  Sar   Sqc dis 10    </td></tr><tr><th>valorem merican Ingot</th><td>N. P. U. BABBITT METAL. F & 6 @ 70</td></tr><tr><th>raziers' Copper, ordinary sizes, over 10 dz., \$\Psi\$ 84. ft</th><td>N. P. U</td></tr><tr><th>over 12 os., ₩ sq. ft</th><td>of, not enumerated, 35 per cent. ad. val. Bars, Block and Pies free. Banca, subject to duty of 10 per cent.</td></tr><tr><th>Lighter than 10 oz. # sq. ft . # B 310 ircles less than 84 ib.i n diameter # B 280 ircles 84 br diameter # B 280</th><td>Banca. # h 200 Straits. # h 16</td></tr><tr><th>gment and Pattern Sheets</th><td>English</td></tr><tr><th>neathing Copper, over 12 oz. # sq. ft # h 23c oit Copper # h 25c</th><td>I C 10x14 } 12x12 Prime Charcoal</td></tr><tr><th>No Copper is Sheathing except 14548 inches and not accept 24 or, to the sq. it.</th><td>IX 10x14   Prime Charceal</td></tr><tr><th>x48, by the case sheet to</th><td>14X20 ) DC 1236x17 "</td></tr><tr><th>X48, by the case ₩ sheet 6c X48, less than case # sheet 8c For tinning both sides, double the above amount. O'NEILL'S PATENT PLANISHED COPPER.—Dis 7% @ 10 %</th><td>For each additional X add. 2.50 COKE TIN PLATE. Best. 2d quality. Ordinary.</td></tr><tr><th></th><td></td></tr><tr><th>and 16 oz. and heavier # B 34c By the case. # B 33c oz. and lighter # B 37c # # # B 30c Boler Sizes.  7 in., 1452 8 in., 1455 9 in., 1456 and 16 oz. and heavier. # B 35c By the case. # B 35c (And all sizes not over 20 in. wide.)</th><td>I C 10X14 / 1 C 12X12 /</td></tr><tr><th>and 16 oz. and heavier. \$\psi\$ is 36c. By the case. \$\psi\$ is 35c (And all sizes not over 20 in. wide.)</th><td>Prime Char. ad quas. Coke. I C 14x2e</td></tr><tr><th>and 16 oz. and heavier 2 m 38c</th><td>I C 20X28 12,to 11.50 @ 12.25 11.00 @ 11.50</td></tr><tr><th>Sheet Iron. # B4te</th><td>I C 14329</td></tr><tr><th>American. American.   os. 10 to 20 ₩ 15 2340 234</th><td>SPELTER—DUTY: In Pigs, Bars and Plates, \$1 #</td></tr><tr><th>21 to 24</th><td>American, cash</td></tr><tr><th>28</th><td>ZINC.—DUTY: Pig or Block, 1.50 # 100 fbs. Sheet,</td></tr><tr><th>  OS.   Pate   Pate    </th><td>  100 BB.   100</td></tr><tr><th>" 25 " W B 9 C; W B 7½c atent Planished</th><td>Donos Stock Ald Motels &c</td></tr><tr><th>MUSSIA. W B Nos. 8 to 14, 130 merican Cold Kolled W B Abyo B Abyo Grown & Sharp's Gauge the Standard for Wire.  BRASS MANUFACTURERS' PRICE LIST.—dis nominal. July 1, 1878.</th><td></td></tr><tr><th>rown & Sharp's Gauge the Standard for Metal; Old English Gauge the Standard for Wire,</th><th>Canvas linen</th></tr><tr><th>BRASS MANUFACTURERS' PRICE LIST.—dis nominal. July 1, 1878. Cash prices for Roll and Sheet Brass. For less quan-</th><th>Canvas linen</th></tr><tr><th>ty than 100 ms. and 30 w m.</th><td>White these rags, 10. 3  Seconds . 154 66 154  Mixed woolens . 256 334  Soft woolens . 856 66  Gunny bagging . 356 66  Jute Butts . 3 6 336  Kentucky bagging . 5 6  Waste paper and scraps . 6 1  Rope cuttings . 156 63  Kentucky bale rope . 4 6 156  Grass rope . 4 6 3  Tarred shaking . 8 6</td></tr><tr><th>Il Nos. not thinner than to No. 28, wider than 2 in., not wider than 14 ib</th><td>Soft woolens</td></tr><tr><th>20 In., Inclusive300</th><td>Jute Butts</td></tr><tr><th>c. W is advance on each No. above Nos. 28 to 38, in-</th><td>Rope cuttings</td></tr><tr><th>Il Bross thinner than No. 38 is Platers' Brass, at 48c</th><td>Grass rope</td></tr><tr><th>neets 24x48, and all sheets cut to particular sixes and lengths under 30 in., in width wider than 2 in. 32c rinters' Kules40c</th><td></td></tr><tr><th>and tengini under 30 in., in witch water than 11. 326 miner's fulles 30 in. and under 40 in 400 heets wider than 30 in. and under 40 in 400 iroular Sheets, in diam. from 4 in. to 14, inclusive. 300 over 4 20, 40, 400  1. 4 20 30, 4 40, 400  1. 4 30 4 40, 400  1. 5 4 40 1. 5 5 5</th><td>  muslin lined   5 6   6   6   6   7   6   6   7   6   6  </td></tr><tr><th>10 Over 14 4 20, 4 1,400</th><td>White Shavings, No. 2</td></tr><tr><th>30 40, 1 500 LOW BRASS. 540</th><td>Book Stock</td></tr><tr><th>40 ♥ B more than High Brass, Gilding Metal, 80 ♥ B more than High Brass.</th><td>Heavy</td></tr><tr><th>laters' or Gold Metal Sawed</th><td>Prints</td></tr><tr><th>Gilding Metal, 80 # 5 more than mign Brass.  (aters' or Gold Metal Sawed - 430 (raned or Polished - 460 Fon stritte.  (ctal in width z in. to % in. to No. 28, inclusive, 10. \$\pi\$</th><td>Bogus Manilas and Hardwares</td></tr><tr><th>ietal in width 2 in to 39 in to No. 28, inclusive, ic. \$\pi\$ advance.  [etal, in width 2 in to 1 in., thinner than No. 28, 2c. \$\pi\$</th><td>Straw Board Cuttings</td></tr><tr><th>B advance. [etal, inwidth 1 in. to 1/4 thinner than No. 23, 30 P B</th><td>Satinet Old Metal. 2 @ 256</td></tr><tr><th>advanc (etal, in width 1/4 in. to 1/4, inclusive, not thinner than No. 28, 20. W B advance.</th><td>  Imperfections, No. 2, Dear Index success   354 68     Book Stock</td></tr><tr><th>No. 28, 20. # B advance. letal, in width ½ in. to ¼ thinner than No. 28, 50. # B advance.</th><td>Brass, light</td></tr><tr><th>madvance. Ictal, 14 in. in width and less, Ioc. W madvance. Iny of the above widths cut to particular lengths, add To. W m.</th><td>Heavy Composition.</td></tr><tr><th>70. GERMAN SILVER WARKET METAL AND WIRE. Market Metal. Wire. 4 per cent., 12 inch, to No. 26</th><td>Powter, No 1</td></tr><tr><th>per cent., 12 inch, to No. 36</th><td>Wrought from per ton 17.00  Machinery Iron per ton 17.00</td></tr><tr><th>German Silver Sheets over 12in. wide and weighing</th><td>Light Iron</td></tr><tr><th>German Silver Sheets over 1210. wide and weighing nore than 10 bs., \$2.00 & b.</th><td>Grate Bars. per ton 4.00</td></tr><tr><th>and 20. W b on each No. thinner than Nos. 26 to</th><td>Paints, Oils, &c.</td></tr><tr><th></th><td>Paints.  Black Lamp, Coach Painters</td></tr><tr><th>derman Silver Strap one man Silver Turnings, Filings</th><th>Black Lamp, Coach Painters. \$\text{\$\exititt{\$\text{\$\exititt{\$\text{\$\exititt{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$</th></tr><tr><th>and Chips, hair the price of Scrap.  BRASS AND COPPER WIRE. Gild'g and High Brass. Low Brass. Copper.</th><th>Black Paint, in oilkegs, ac asst'd cans, 110</th></tr><tr><th>Toto to 20</th><td>The second secon</td></tr></tbody></table>	

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43 43 46 46	Blue Chinese dry 71 ramarine 18 @ Brown, Spanish 2 Carmie an Dyke combination process. Chrome 25 @ Carmie 25 @ Car
53 56 57 73 88	Brown, Spanish   106   107
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et nd	Red Lead, American English Venetian (N. C.) dry Section 1, 20, 20, 20, 20, 20, 20, 20, 20, 20, 20
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	White, Paris, English, prime
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" in oil 10 @ 16 @ 18c	BIAGO.	production from	-	-	
n, Chinese goc, gold	6 X 8 to 10 X 15	\$ 8.00	\$ 6.75	8 6.25	\$ 5-7
Trieste	11 X 14 to 16 X 24	8.75	8,00	7.50	8.7
American, Common150	18 X 22 10 20 X 30	12.75	11.50		0-7
ad, American, pure dry 7 to 80	26 X 28 to 24 X 36	13.50	12.25		
ris. English, prime	26 x 36 to 26 x 44	14.75	13.75	31.75	
chre, French81.75	20 X 40 to 30 X 50	17.25	15.00	13.40	
in oilasst'd cans, iic; kegs, ec	30 X 56 to 34 X 56	18.74	16.75	15.00	
brome	34 X 58 to 34 X 60	19.50	18,00		
4 in oil14 @ 18 @ 250	b x 8 to 10 x 15.  11 X 14 to 16 X 24.  18 X 22 to 20 X 30.  15 X 36 to 24 X 30.  26 X 26 to 24 X 36.  26 X 36 to 36 X 44.  26 X 46 to 30 X 50.  30 X 56 to 30 X 56.  30 X 56 to 34 X 56.  30 X 56 to 54 X 56.  30 X 56 to 54 X 56.	31.00	19.50	18.00	
te, American No. 1, dry7c	Double Thick.				
Prench (Paris)	Double Tallett				
" in oil 10 @ 110	SIEES.	181.	ad.	30.	4t b.
Oile.	6 x 8 to 10 x 15	Br2.00	BIT.OO	810.00	
Raw, in casks and bbls.   # gal. 53c & 64c	6 x 8 to 10 x 15 11 x 14 to 16 X 26 18 x 22 to 20 x 30 15 x 36 to 24 x 30 26 x 38 to 24 x 30 26 x 38 to 24 x 36 26 x 36 to 30 x 44 26 x 46 to 30 x 50 30 x 36 to 30 x 50 30 x 36 to 30 x 50 31 x 38 to 34 x 56 33 x 50 to 44 x 56 34 x 38 to 54 x 56	14.75	13-75	13.75	11.7
Boiled. " " " 68c & 70c	18 x 22 to 20 x 30	19.00	17-75	16,00	
Whale # gal. 510	15 X 30 to 24 X 30	21,40	19.25	16.50	
Elephant428	26 × 26 to 26 × 44.	25.00	23.00	10.25	
530	26 x 46 to 30 x 50	27.00	25.00	21.25	
rd 590	30 X 52 to 30 X 54	28,40	20.00	22.25	
zinia18c @ 250	24 X 68 to 24 X 60	31.75	30.00	18.25 19.25 21.25 22.25 24.75 27.00	
	36 x 60 to 40 x 60	35.50	32.50	30.25	
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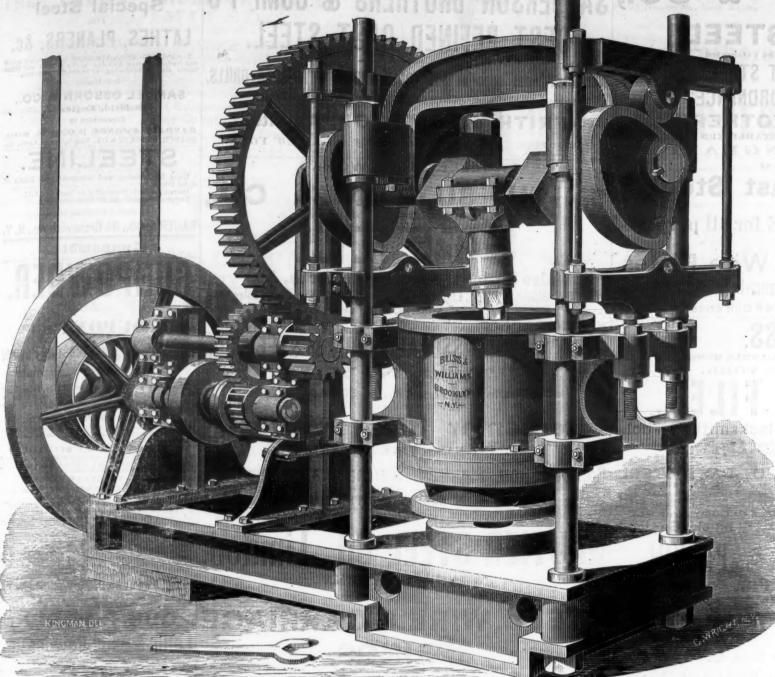
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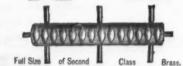
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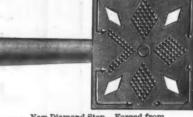
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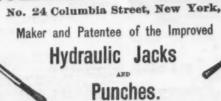
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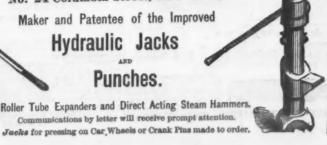
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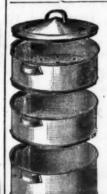
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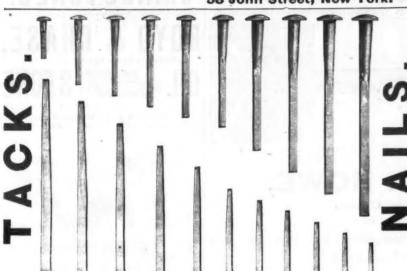
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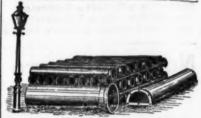


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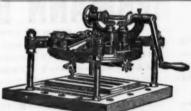
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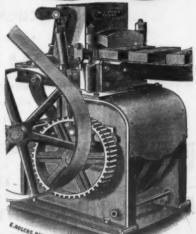
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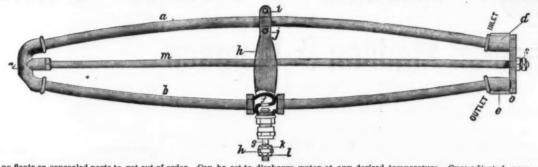


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No. 1, 10-6x4 in. face, 4 in. jaw Vise, weight 40 lbs. 84 10. 2, 8x3/4 in. face, 3/4 in. 25 ii. 3 10. 3, 6x3/4 in. 25 iii. 25 iii. 3 The face of the Anvil is chill hardened. Terms cas belivered on cars at Worcester. RICHARDSON MFS. CO., Worcester, Mass.
Liberal discount to the trade.

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NEW YORK AGENCY

George C. Grundy. HARDWARE,

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Agents for the Philadelphia Star Carriage and Tire Bolts

### BRADLEY, REIS & CO. NEW CASTLE, PA., Manufacturers of every description of

ATE & SHEET IRON OFFICE, at Works.

1879

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76."

	February 13, 1879.	
	PHILADELPHIA.	1
	(Corrected markly by Lloyd, Supples & Walton), Torms, 30 days. For 60 or 90-days, interest added at 10 per cent, per annum.	
	Anvils Wright's, & D. gold	
	Peter Wright's, S B. gold	
	Apple Farers per dos \$ 5 00 net geading No. 73 600 net geading No. 74 70 net geading No. 75 750 net 75 10 net geading No. 75 10 net	
	vivie Favorite, cover and slicer 7 50 mes	1
	Axes. Bed Warrior	
	Red Chiefand 8 50 6 9 50 het Crown Prince	1
	Cook's Augers	-
ì	Lots of 10 to 35 dozen special content o	-
ı		1
	Bells	
ı	Section   Sect	1
ı	Reving Machines.— List \$9 00 dis 40&10 s Upright, with Augers 550 dis 40&10 s	
ı	Angular, with Augers	1
ı	Philadelphia Stanicy, wrought Shutter. dis 50  Stanicy, Braces dis 40&5  Braces dis 50  6 50&10  8	1
ı		1
ı	Brits - Cast Lose Joint, Narrow dis 764-10 s   Cast Lose Joint, Narrow dis 764-10 s   Broad dis 764-10 s   Acorn, Lose Fils dis 704-10 s   Acorn Jap'd dis 754-10 s   Acorn Jap'd dis 754-10 s   Acorn Jap'd dis 754-10 s   Acorn Jap'd dis 764-10 s   Acorn Jap'd dis	
ı	# Acoru   dis 70&10   dis 70&10   dis 70&10   mayer's Loose Jin.   dis 50   mought Loose Jin.   dis 50   mought Loose Jin.   dis 50   mought Loose John   dis 50   mought Loose John   dis 50	1
ı	Blind Butte. dis 75&10 s	
ı	Clark dis 70-610 g Shepard dis 66%-610 g Lull & Porter dis 33%-6 33%-610 g	
ı	Loose Joint	1
ı	3-16   3   10   11   11   12   12   13   14   15   16   16   16   16   16   16   16	1
ı	Onsters.	1
ı	Oeffee Mills.—Do Market dis 33d \$20 \$ Enterprise.— dis 33d \$20 \$ Outlery.—Walden Pocket dis 35d \$2 cash Lander', Frary & Clark, J. Hussell & Co., Lamson & Googoow Mfg. Co. and Meriden Cutlery Co., Manu facturer' prices net.	1
ı	Goodow rices net facturers' prices net  Brawing Knives.— Hart Mig Co.". dis 63, 5&10 s Adjustable Handie. dis 20 g	1
ı	Pry Pans. dis 50&10 @ 60 \$	2
ı	## PARMS	1
ı	No 0 1 7 7 7 10 1 8 7 7 10 10 10 10 10 10 10 10 10 10 10 10 10	1
ı	Butcher	
ı	Spencer	1
ı	Geneva Fiuterdis 20 % Favorite com. Fiuter & Sad-iron ¥ doz \$20 dis 25&10 + Rammersdis 20 % Yerkes & Plumb's	1
ı	Hatchels, Cerkes & Plumb. dis 3314 4 Hutt. dis 25 5	1
ı	Blueres   Strap and T	THE PROTOCOLOR
ı	Clinton	ľ
ı	Clinton	1
ı	Branfordnew list, dis 60&10&2 % cash Gaylord Cabinet	1
ı	8 candinavian Pad Locks	300
ı		54
ı	Square Candle and Oil	HH
ı	Mattecks	
ı	Reinsses Gates.  Baterprise Mfg. Co. s Measuring Faucets	40
ı	Cork Lined dis 65 @ 63&10 %  Meat Cutters.—Dixon's	0
		da
	Enterprise Stuffers	SK 55-K
	Bailey. dis 25 & 10 % Plane Irous.—Sandusky. dis 10 & 10 % Butcher's. gold £, \$5 50 Plumbs and Levels.	SH 34
	Bianiey's Adjustable	W New
	Pumps.—Bickford.       \$7.10, dis 20&10 %         Haises—Starley Boxwood.       dis 70&10 %         Stanley Ivory.       dis 60&10 %         Steelyards.—Hart's Pattern.       dis 60&10 %	002 2
	# doz\$14°50 17 75 21°00 26°50 31°10 35°50 100 150 200 460 300 4merican Pattern	SLC
	# dox. #\$0-50 7:00 9:00 13-00 189 25 25:10 8	BEHEC
		COPH
-	Seythes.—Golden Clipper, Damascua Blade, Boxed and Sharpened	G
	Cupper No. 5. Painted Red. Boxed and	C
	Sarpened.  Sawe—Disaton's Hand, Panel and Rip. 4 dos \$7-25 net Disaton's Circular.  Circ	HOSS
		PR
	Shed Fons. 4 to 10 lbs.	P
	Washing Skirg   \$200 net   \$200	68
	Turkey Oli Bone No. 1 163 ce net  Axe Stone. 1 165 ce net  kindostan Oli Stone No. 1 25 ce net	24
1	Axe Stone 5 65%c net	Ca

	$\Gamma$	1
	Flated, German Silver. dis 40 & 40a5 5 German Silver. dis 30a 10 Britannia, Boardmant. dis 30a 10 Farkers dis 65 T.nned dis 15 & 20 5	
10	Springs -Torrey # doz \$200 @ 210 net	
cet et	Gem Coll No. 1, Large sap d	
et et et et	Stocks and Dies.	
30	4-8 and larger, 9c; 534-8, 934c # B New list, net	
16 45	Double Pointed Tacks	
***	Agricultural	
N N	Bright or Ann'd, No. 19 to 36	
5 5 5 5	Coppered 0 to 18	
*	PITTSBURGH.	
\$ 5 B	Merchant Iron.  **Flat Bor.**  1½ to 4x½ to 1 in1800   1½ and 1½x¾ to ¾ in1900   1½ and 1½x¾ to ¾ in200   1½ to 6x½ to 1½ in200   ½, ¾ and ½x¾ to ½ in200   ½, ¾ and ½x¾ to ½ in200   ½	
PRAB	134 to 6x136 to 134 in 2.200   36, 34 and 32x36 to 36 in 2.200   Rounds and Squares.   36 to 9-16 in 20   2 to 236 in 20   36 in 2.200   36 in 2.400	
	Rounds and Squares.  1 to 11/4 in 1.80c 3/4 to 9-16 in 200  2 to 11/4 in 200  3/4 to 3/4 in 2.50c 3/4 in 2.50c  4/4 to 3/4 in 2.50c 3/4 in 2.50c 3/4 in 2.50c	
***	34 to 6344 and 5-16 in. 20 34 to 3434 and 5-162.300	
***	Light Bands.  1 to 13£X½ to 3-16 in2.100 34 and ½X½ to 3-16 in2.500 34 and ½X½ to 3-16 in2.500 34 and ½X½ to 3-16 in3.500 34 and ¾X½ to 3-16	
* * * * *	Hoop From. 3 to 16.4.50c   \$\frac{4}{8}\$ \times 9-16, Nos. 17 to 204.80c   \$\frac{4}{8}\$ \times 9-16, Nos. 17 to 204.80c   \$\frac{4}{8}\$ \times 9-16, Nos. 17 to 204.80c   \$\frac{4}{8}\$ \times 11-16, Nos. 17 to 2030c   \$\frac{4}{8}\$ \times 11-16, Nos. 17 to 2030c   \$\frac{4}{8}\$ \times 11-16, Nos. 15 to 155.50c   \$\frac{1}{8}\$ \times 12, Nos. 15 to 155.10c   \$\frac{1}{8}\$ \times 0.2, Nos. 13 to 152.50c   \$\frac{1}{8}\$ \times 0.2 to 2.0.80c   \$\frac{1}{8}\$ \times 0.2 to 2.0.	1
	1-100 W m extra for each, gange lighter.	1
K K	Veto 1¼ in         Oval Fron.         2.5cc           ½ to 1¼ in         2.3co         ½ in         3c           ½ to ½ in         3c         3c         3c           Half Oval & Half Round         ½ in         3c         3c           ½ to 1½ in         2.5cc         ½ in         3c           ½ to 1½ in         2.5cc         ½ in         4.5cc	
h	No. 18 to 212.50c 4.50c No. 27	1000
E E	Wood's Patent Planished Sheet. 1st quality (A)	11
0	Galvanized Iron-Juniata.   150	of of oto
	Roofing Iron, Corrugated or Crimped,   Galvanized Common,   Black,   No. 20	-
t	Bridge Iron. Carnegie Bros. & Co.'s list. Beams and Channels. Solid Wrought Iron Beams, 3 to 10/4 in.x30 ft % In 25/40	
6666	Eccimic and Channels.   Eccimic and Channels.   Depth by St.   D	1
	1 in.x1 in. to 5 in.x3 in ₩ 15 2.80	
8 00	Equal Sided, 1x1 to 13/x13/11	
2000100000	Nails   Fence and Brads   Fence and Frads   Fe	8 2
-	\$\begin{array}{cccccccccccccccccccccccccccccccccccc	
-	Lining.  \$4 in	
	Slating.	
-	4d. 3.15 2d 5.15 2d 5.	4
	8d. 3.15 3d 4.65  Fine Blued. 3.90 2d 5.15  4d. 5.15	
	Cut Spikes—All sizes. 2.40 Boat Spikes—All sizes. 2.50 TERMS.—Note or acceptance at 60 days; or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice. An abatement of 10 cents per keg allowed upon orders of 200 kegs or over.	6
	date of invoice. An abatement of 10 cents per keg allowed upon orders of 200 kegs or over.  Soware. Flat and Octagon Tool Steel	A
	##teel.  ### ### ### ### ### ### ### ### ### #	
	## Anne   1416, Die   1416   1	H
	r to 4x¼ to ¼ in 6½c   ½ to 1½xx-32 to 3-16 in8½c  Agricultural Steels.  Solid Cast Steel Plow, 4 to 16 by 3-16 to ¾ in	6
	Solid Cast Steel Plow, "4 to 16 by 3:16 to 34 in. 7c "Iron Center Plow," 4 to 16 by 3:16 to 34 in. 8c "Iron Beak Plow," 4 to 16x3:16 to 34 in. 8c Soft Steel Center Plow, 4 to 16x3:16 to 34 in. 84 c Soft Steel Center Plow, 4 to 16x3:16 to 34 in. 9c Landside and Cultivator, C. S., 3; in. thick. 95 (Circular Plow Coulters, 5:32 to 34 in. thick. 11 Reaper and Seythe. 13c	ı
	Circular Plow Coulters, 5-32 to 1/1n. thick. 110 Reaper and Scythe. 130 Fork and Hoe. 70 Horse Rake Teeth, tol ength. 80 Finger Bar. 85/c Cutter Bars, C. 8. 85/c Cornstalk Cutter beveled to length. 80 Planters' Hoe, C. 8. 99 Hoo, C. 8. 86/c German, 10 to 16 g. 86/c German, 10 to 16 g. 86/c Common C'st, 17 to 20 g. 100 Common C'st, 10 to 16 g. 130 Common C'st, 17 to 20 g. 140	L
-	Cornstalk Cutter beveled to length	1
1	" 17 to 20 g110 Best Cast, to 60 16 g130 Common O'st, 10 to 16 g. 90 " 17 to 20 g140 Rells and Castings.	Bin pl
-	Housings and Castings not otherwise specified 24c Guide Plates	th FI W
	" small size	cl
	Pulleys up to 30 inches     4 4 434       "over 90 inches     34 6 346       Engine Castings, light     346       heavy     346	GK
	Common C'st, 10 to 16 g. 9c   " 17 to 20 g140  Relis and Castings.  Furnace, Floor and Straightening Flates146 20  Housings and Castings not otherwise specified246  Spindles and coupling boxes	-
	Heavy Hardware.  Lewis, Oliver & Phillips, discount off Standard List. Carriage & Tire Bolts, ordinary orders 75, & 5 off net Stove Bolts	0
1	Elevator Bolts	4

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	Washers, a Nuts and and Was # B ex. Strap and Harrow Te Skein Bolt	ressed Sq. a ull made from Washers in thers in lots Nuts and T Hinges s. Washers bla and Poke	m new b 25 % b less that Vashers	and iro oxes, 3 n one li in 5 %	n8c 6c a n ceg ea boxes, fod	ex. ch sis te #	N IN
	Cast Iron Fire Shove Single Tre from bes	Washers  ols and Poke  Wage  os, Neck Y  t selected h	n Harokes an	dware d Dou	ble Tr	rees, 1	ma
	the most No. 1 South complete No. 2 West complete No. 3 Wago	Waga es, Neck Y t selected h approved p hern Plow i , Irons all v tern Plow i , Irons all v on Single T Wrought, er	atterns. Single T Vrought Single Tr Vrought ree, Iron	ree, Ir	oned oned oned lete.	ich, 25	e n
	No. 4 Wago	on Single Tr	e. Irone	d comp	lete.		-
	Wrought Iron Rin Southern I plete, Iro Wagon Bo	Wrought; In; one side of to rub again, Ironed control of the contr	Ferrule Tree, I	, Iron s, with roned	wt. ei	ach, 60	en
	10 in. lon 12 in. " 10 in. "	For orders 8 by 7-16 at 8 9-16 9-16	of 100 Selected Ex	t, 45&10 ad, # a	% dis. et of 8 8	bolts.	. 4
	12 in. " 14 in. " 10 in. " 12 in. " 14 in. " 16 in. "	9-16	66 64 64	64 64 64 64	888	66	. 28 8 9 K
	20 in. " 50 ₹ set for lengths i	r each addit	ional in	ch ove		nches.	. I.
	5-16 36 7-16	Reiter	& Morto 70   1/6. 60   9-10 60   5/6.	n's Lis	i.	nik.	-53 -53
	Juniata Ho	orse Shees ule "Roadster" p Calks od & Co.'s	s, Etc	-In 100	keg lo	ts. r keg.	22
	Thistlewood Shoes	od & Co.'s Se	f-Sharpe	ning 8	now	44	5
		White d in Oil, Ass 25 B					
	Orange Mil Litharge Dry White White Le ditional.	Leadless to ad in Oil in	han 500 l lots of l	bs., 690 ess the	n 500	too lb	8.59 C a
	from date be allowed	Note at sixty of invoice, a l, but not of Win Per Box of	dow G	lass.			W
		Size.	gle Stren	AA.	Α.	В.	C
	6 x 8 to 10 11 x 14 to 16 18 x 22 to 20 15 x 36 to 24 26 x 26 to 36 26 x 46 to 36 30 x 52 to 30 30 x 56 to 34 34 x 58 to 34	x 15		\$7.50 8.50 10.75 12.25 13.00 14.50 15.00	\$6.75 7.75 9.75 10.75 11.50 13.25 14.00	\$6.25 7.25 8.75 9.00 9.75 10.75 11.25	856.7
		x 60.  bit Strength  x 15.  x 24.  x 30.  x 36.  x 44.  x 50.		12,00 13,75 17,25 19,75 21,00 23,25 24,00 25,75 27,75 29,25	11.00 12.50 15.75 17.25 18.50 21.25 22.50 23.25	10.00 11.75 14.00 14.50 15.75 17.25 18.00 19.25	10
	34 x 58 to 34 36 x 56 to 40 An addit glass more	x 60. x 60. ional 10 pe than 40 in ength and n	r cent.	27.75 29.25 33.25 will be de. Al	Secon	-4.13	or a
	inches in le inches, wil	1 be charged	in the &	united	i inch	a 81 ui es bra	nite cke
		cago Stampi	ing Co. 1	10, 12 d	14 La		
	10x14, IC, 10x14, IC, 10x14, IX, 12x12, IC. 12x12, IX, 14x20, IC.	Charcoal Ro	6 50 · DC 8 50 · DX 5 50 · DX 8 50 · DX	X. Roofin	s, "	* :	1026
	20x25. IC, 20x25. IC, 20x25. IC, 20x25. IX, 10x14, IC, 14x20. IC.	Charcoal Ro	oting, G	ood			12 16 6
	10x20, IC.  Biock Ti  Large rig  Bmali	n	19c   Bar	·······			. 2
	Copper.— Sheathing	Bottom#		** ****			21
	Ingot Bolt Braziera	Botter lengt  *hoct** 7 lba # 1 9 lba * S. & Co. * 1	d0c ! 900	660, 10 t	o 12 lb	6 <b>3</b> 1	24
	Best Fine No. 1 Roofing	S. & Co. 9 I	nake			. 23 6	14 18 134 0 25
	Antimony Bubbit di No. 2 Sheet Iro	etal—F.S. n.—	& Co.s.	n Sr	noeth	· Smo	10
	No. 24 25 & 2 27 Gaivaniz	Common 8*10e 8 8*30e 85 c	3 90c 4 10c 4 30c 4 30c 4 30c	5 6 6		234	e
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1	S. Company	- Charles Advanta	The state of the s	2:00	ASS - 8 - 50 - 50 - 50 - 50 - 50 - 50 - 50	5	

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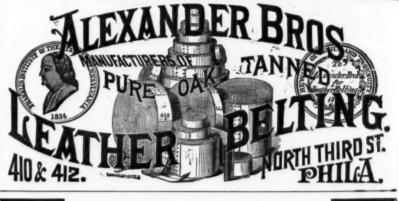
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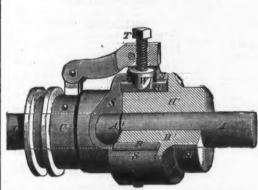
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We claim for this device the following advantages for a perfect clutch, it having been adopted by several of the leading manufacturers of machinery and machinists' tools: It works easily but effectively. It works instantly and without noise. It is very durable, and is extremely simple and cheap, and has proven itself to be the best clutch in the market. Special arrangements can be made with leading manufacturers for the adoption of this clutch for their own tools. This clutch can and will be sold for less money than any other clutch in the market.

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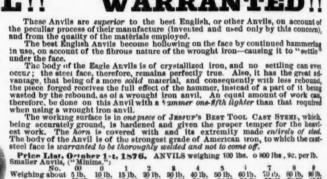
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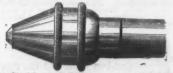


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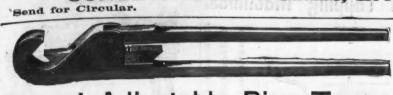
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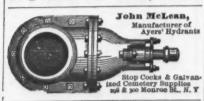
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	4 34 in., No. A \$\$\text{\$\exititt{\$\texititt{\$\text{\$\text{\$\tex{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$\text{\$	C
	Axle Clips Stors in No. C. Spidos Los Axle Clips Stors in No. C. Sister Spidos Los Adis Cos Balances.—Chatillon's Barn Door Rail.—  Cast Angle (for Anti-Friction Hangers). por ft. 30 256 156 167 167 167 167 167 167 167 167 167 16	20.00
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	No. 5	I
	"Wool	W
I	Coil 3-16	W
I	" 5-16.	W
I	"地 5分配 Chilk。—White, Carpenter's. 単 gross 450 Red, Carpenter's. 単 gross 750	*
l	Blue, \$\frac{\pi}{\text{Chisels,}}\$—Hart, Bliven & Mead, Framing	1
I	Clothes Line.— Galvanized Wire, 100 feet each	2
	Ch 1 k.—White, Carpenter's # gross 5/9c Hue, Chapenter's # gross 5/9c Hue, # gross 5	W
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12x12, 9-4	D.X. X. 13/gx17	150
X. 12x13, 6-50	I.C. 20x28, 14v20	
14x20, 6-50	I.C. 20x28, 270	
2x, 14x20, 8-51	I.C. 20x28, 270	
2x, 14x20, 1-10	I.C. 14x20, 8-10	
X. X. 14x30	14	I.C. 20x28, 18
12x24, 6-57	I.C. 12x24, 18	
150	I.C. 12x14, 19	
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Solder	Extra in Bars.	12c	No. 2, in Bars.	99.		
No. 1, in	10c	Spelter Solder.	2			
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Antimony	1	Bars.	4			
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No. 1	1	1	1	1	1	1
No. 1	1	1	1	1	1	
No. 1	1	1	1	1		
Babbit Metal.	9	16c	No. 3,	9	8	11
Cesper	16	1	1	1	1	1
Tadders, 30.560, 14 to 100	bs. Sneets	2				
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Bar Copper, 6	2	3	3			
Copper Bottome	3	3				
Soldering Coppers	3	4	4			
Soldering Coppers	3	4				
Soldering Coppers	3	5				
Soldering Coppers	4	5				
Soldering Coppers	4	5				
Soldering Coppers	4	5				
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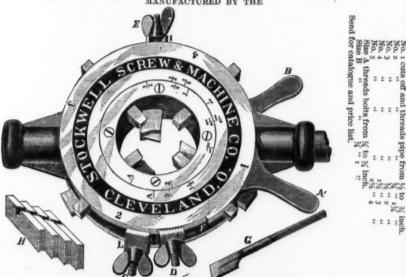
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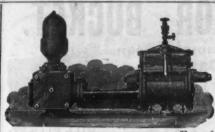
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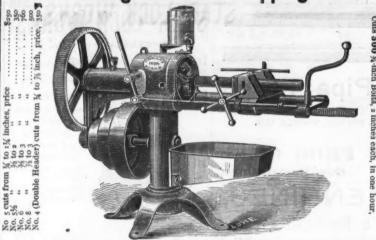


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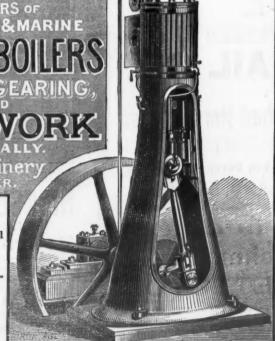
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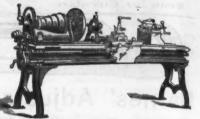


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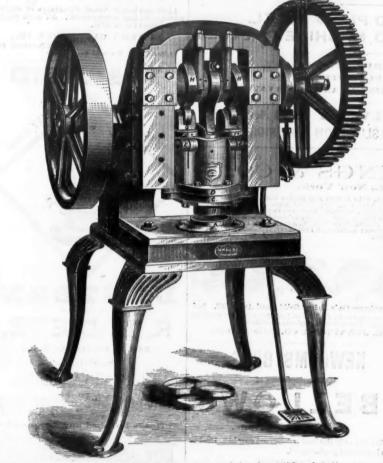
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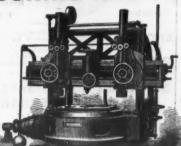
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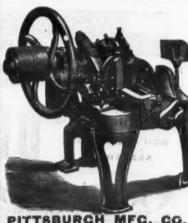
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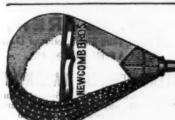
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